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U. S. GOVERNMENT

MANPOWER RESOU
IN THE EARTH SCIE

A Study Conducted Jointly
The National Science Foundat
and
The United States Department o
Bureau of Labor Statistics

FOREWORD

Manpower Resources in the Earth Sciences is the fourth in a se
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ALAN T. WATERMAN
Director

vember, 1954

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INTRODUCTION

sciences, which emerged as a
d of scientific study during the
ntury, have had their most rapid
World War I. During this brief
have contributed enormously to
economic development and to the
ıse, while making great progress
l fields. The petroleum industry
ast economic and military activ-
depend on oil could not have
heir present magnitude without
ts and geophysicists who help
exploit new oil fields. A highly
ience of meteorology is indis-
present-day aviation operations,
y and civilian, as well as to
erations and other aspects of our
omy. Geophysicists specializing
have aided in the solution of
ch as water supply, irrigation,
ıtrol, of importance to the eco-
ocial well-being of millions of

ists responsible for these and
ıpplications of the earth sciences
hing and fundamental scientific
se fields number about 25,000
less than one-tenth of 1 percent
abor force. To provide informa-
characteristics and employment
l but important segment of the
sonnel resources, the National
gister in 1951 conducted a survey
science professions, in coopera-
American Geological Institute
liated societies, the American
Jnion, and the American Meteor-
ety. This report presents the
s of the survey.

fication of earth sciences in the
vs that used by the National
gister in the original survey. In
his classification, the Register

naires and so have been inc
statistical study. Approximately
gists--estimated to be about o
professional geologists in the
included. The 2,800 meteorol
study comprise a still higher
probably about two-thirds--of
meteorologists. In geophysics
meteorology), however, the su
a somewhat smaller segment
sion; the more than 2,900 geop
sent in questionnaires are beli
prise about one-third of the to
the geophysical specialties re
addition, the study included abou
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number of graduate students i
in 1951.

A comparison of the statisti
in the study with estimates of th
of living Ph.D.'s in the earth sci
that, for all earth scientists as
survey covered a somewhat high
of those with doctorates than
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coverage of Ph.D.'s no doubt
the fact that most respondents v
of professional societies and
studies have shown, the bette
members of a profession are
likely to belong to professional

In view of the high coverage
of all earth scientists with
believed that the findings fo
trained group of scientists ar
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that the surveyed meteorologi
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erally representative of all su
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the latter, the coverage of sci

OS OF SPECIALIZATION

m of classifying scientists ac-
heir fields of specialization has
y more complex and difficult in
es. While specialties have pro-
lines of demarcation between
ecome blurred at many points,
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veys conducted by the National
ister, the problem of determin-
' specialties was resolved by
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ation procedure provide excellent
on the characteristics of per-
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each field, since they exclude
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ld but have still greater com-
ther specialty.
the three earth science profes-
ost numerous groups of speci-
ose which are primarily applied
nore than 4,000 geologists who
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etroleum and natural gas were
ngle group. Comprising 62 per-
geologists in the survey, this
ployed mainly in the petroleum
gas extraction industry. The
of geophysicists--the 53 percent
cialists in geophysical explora-
so concentrated in the petroleum
re they worked closely with the
ologists. Among the surveyed
s, the largest group (more than
ere specialists in synoptic mete-
ged in weather observation and
Hydrology, the branch of
oncerned with the supply and
ter in land areas of the earth,
of highest competence for almost
the surveyed geophysicists. The
logists--the fifth largest group-
percent of all reporting geolo-
umbers of specialists in other,

respondents in the less integ
geophysics.

Graduate students in the su
whom had not advanced far enough
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than did the experienced scient
cialties cited by the largest numb
in each of the earth sciences
as those reported by the larg
scientists--that is, petroleum a
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meteorology. However, relativel
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in these applied specialties, an
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EDUCATIONAL BACKGR

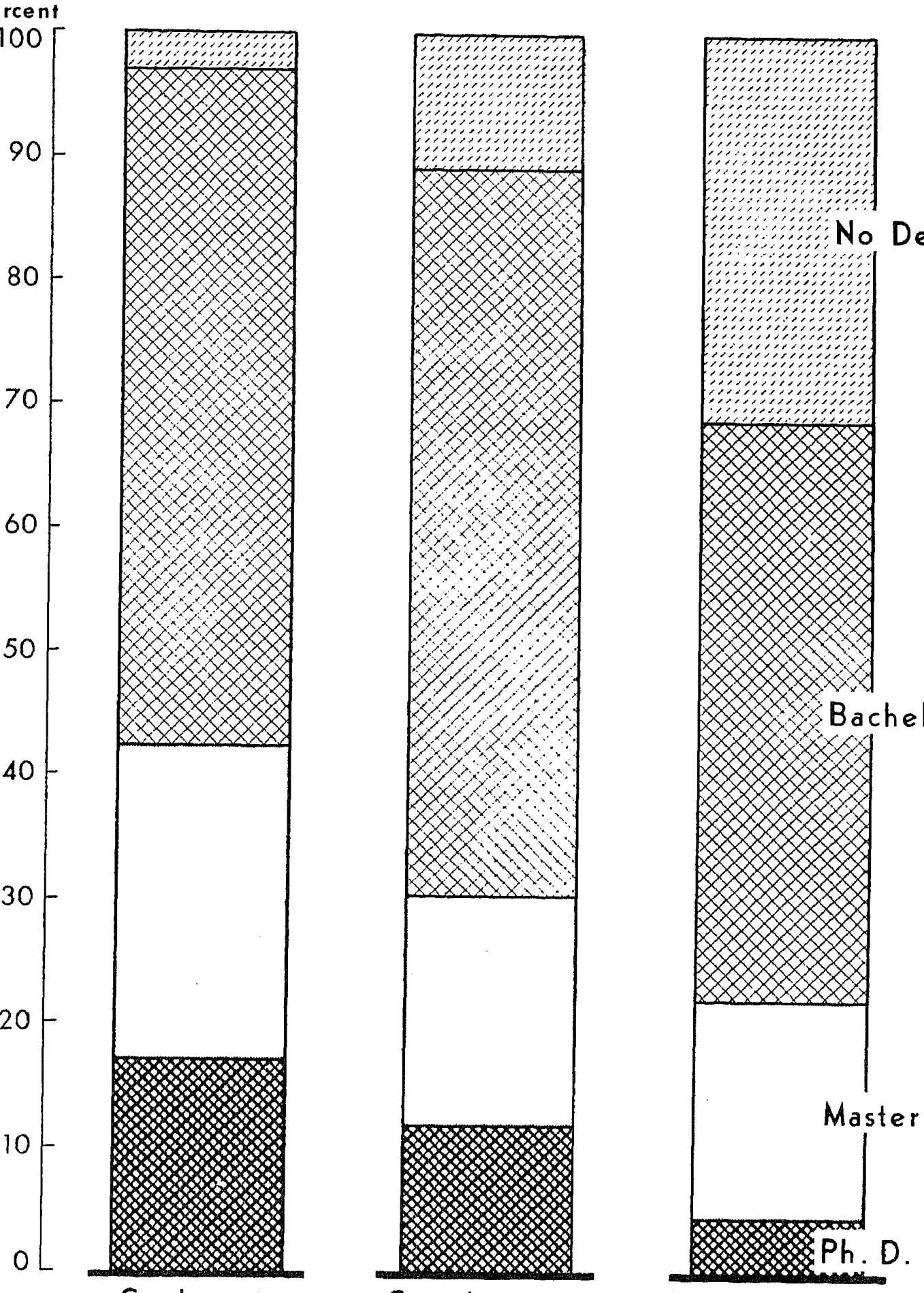
Level of Education

Because of the traditional imp
Ph.D. degree in college and unive
ment, the extent to which membe
sion are engaged in universit
research is one of the major f
mining the proportion with d
the three professional groups
geologists included both the high
of Ph.D.'s (17 percent) and the
faculty members. The geophysic
12 percent held doctorates, r
with respect to university emp
The meteorologists, of whom o
held Ph.D.'s, were the group wit
proportion employed by college
sities.

Besides the scientists with do
professional included a sizabl
master's degrees (as shown in
proportions with bachelor's deg
much larger, however--over ha
geology and geophysics and n
meteorology. In addition, almos
the meteorologists, one tenth
physicists, and a much small
of geologists (3 percent) had
fessional status without holdin
degree.

The scientists who did not
degrees were concentrated in the

Percent Distribution of Earth Scientists by Level of Educa



specialties, where the main employment opportunities are generally in teaching and research in colleges and universities.

Graduate students in the survey were, for the most part, working for their master's degrees. The baccalaureate was the highest degree held by about two-thirds of the students in each of the three fields. Approximately 30 percent had already received their master's degrees, and a few were engaged in post-doctoral studies.

Fields of education.--Geophysicists and meteorologists have a diversified academic background. Not quite one-fifth (19 percent) of the surveyed geophysicists had majored in geophysics or physics in taking their highest degrees, whereas 37 percent had majored in engineering, 28 percent in geology and the remaining 16 percent in other fields. Of the college-trained meteorologists only 30 percent had majored in that science; the others reported majors in mathematics, engineering, physics, and a variety of other subjects.

The diverse academic training of the geophysicists and meteorologists may be traced to several factors. Probably the most important are the comparative recency of organized academic curricula in these scientific fields and the fact that there are still only a limited number of educational institutions which grant degrees in either field. In consequence, many persons planning to specialize in geophysics have taken their major training in geology or other related subjects. The wartime expansion in meteorological work also made it possible for many servicemen and civilians without a related academic background to enter the profession through employment as weather observers.

Geologists, on the other hand, usually take their highest degrees in that science. Approximately 87 percent of the college-trained geologists in the survey had majored in geology. Most of the others reported majors in petroleum, geological, mining, or metallurgical engineering.

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Military Status

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were reservists.

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reserve status;
theless, it is e
of reservists w

scientists were resident aliens. The proportions of aliens and foreign born citizens among these scientists were smaller than in the adult urban population generally.

Table 3 shows the citizenship status of the surveyed geologists, geophysicists, and meteorologists as of 1951.

EMPLOYMENT

Fields of Employment

A comparison of the fields in which the scientists were employed at the time of this 1951 survey with those in which they were most competent shows that, as would be expected, the great majority were working in their primary specialties. However, a few of the scientists who regarded themselves as geologists (7 percent) and larger proportions of the geophysicists (14 percent) and meteorologists (17 percent) were working in other fields. Most of these geophysicists had positions in related scientific fields, but the meteorologists who were not employed as such were working mainly in nonscientific activities (table 4). These meteorologists probably included a number whose work in the science ended during the postwar contraction in meteorological activities, but who still considered themselves members of the profession.

The following information on employment and income relates only to persons who were working as geologists, geophysicists, or meteorologists in 1951. Among the 6,194 employed in geology were a few who regarded geophysics or meteorology as their first specialty. Similarly, the 2,653 with positions in geophysics and the 2,336 working in meteorology included small numbers recruited from other earth sciences (as shown in table 4).

Major Types of Employers

Private industry is by far the largest source of employment for geologists and

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Professional I

Geophysicist
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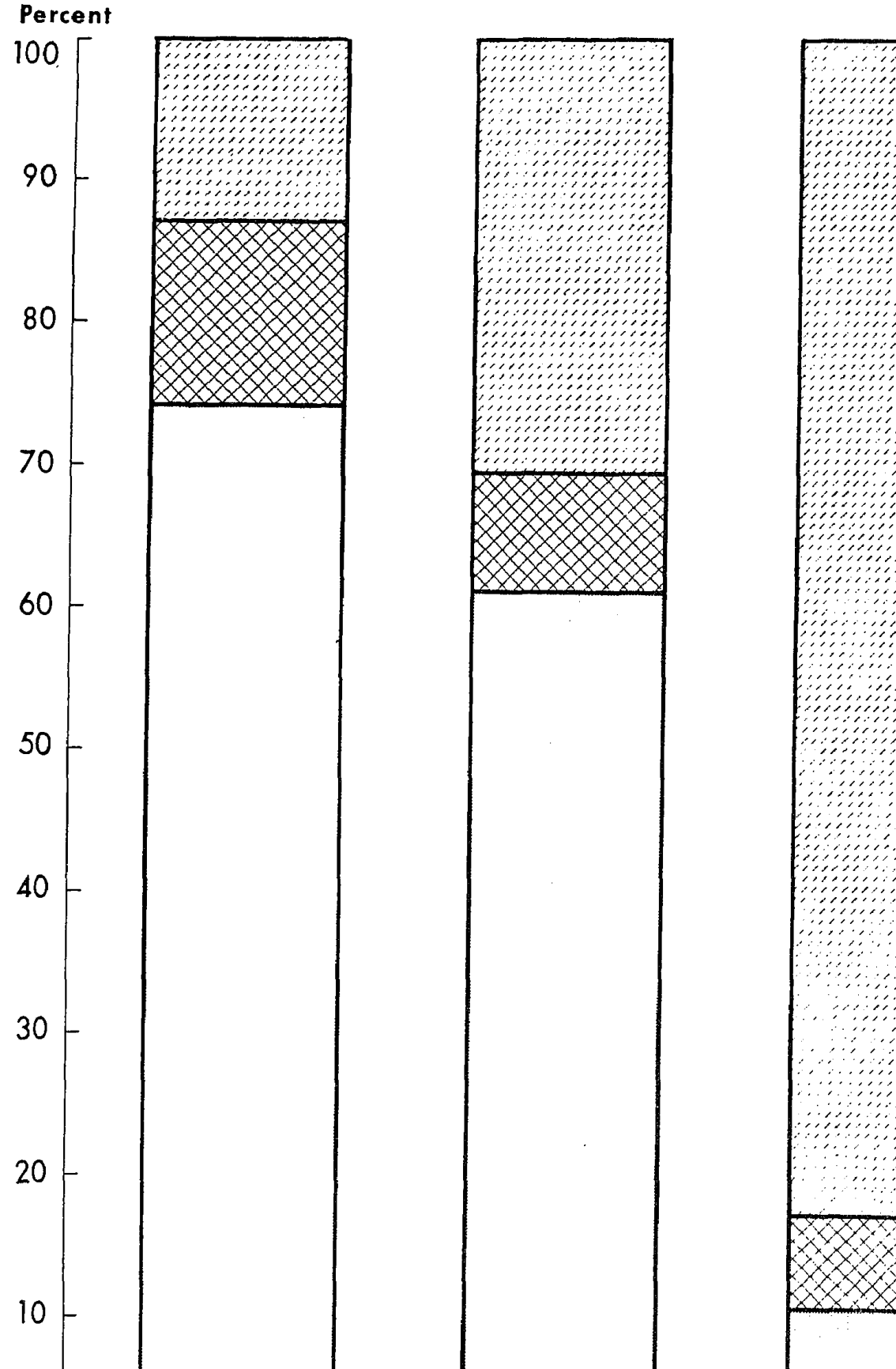
in the survey

Chart 2. PRIVATE INDUSTRY EMPLOYS MO
AND GEOPHYSICISTS—GOVERNMENT EMPLOYS M

Percent Distribution of Earth Scientists by Type



median income for the profession as a whole and the plateau in average earnings reached at a comparatively early age.

In each of the three fields, Ph.D.'s had substantially higher income levels than the scientists with less advanced training (table 5). The masters had somewhat higher average earnings than the scientists with less advanced training in most, although not all, types of employment. In private industry, the few respondents without college degrees had higher median incomes than the bachelors, but these scientists were undoubtedly a select group of experienced and otherwise highly qualified persons.

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For geologists c
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FIELDS OF SPECIALIZATION

Geology--which may be broadly defined as ıe study of rocks and their structures and of arth history as disclosed by rock formations nd fossils--is the largest of the earth science rofessions. The total number of professional eologists in the country is estimated to be ıore than 12,000, or roughly half of all earth cientists.

From its beginnings as a pure science-- oncerned with the nature and history of the ıysical features of the earth, with rocks and ıinerals, and with the evolution of plant and ıimal life as revealed by fossil remains-- eology has developed into a profession the ıajority of whose members are engaged in ractical applications of the science. More- ver, the major emphasis in geological re- earch has shifted from historical description analysis of the changes occurring in the arth's structure.

Geological knowledge and techniques have een applied most extensively in exploration r petroleum and minerals, primarily the rmer. Sixty-two percent of the geologists in e present survey listed petroleum and natural ıs as their field of highest competence. pecialists in economic geology, primarily oncerned with locating and exploiting mineral eposits, were the second largest group of espondents, but they represented only 8 per- ent of the total number.

Other specialties listed by relatively small ımbers of respondents included paleontology, e science of fossil identification and classi- cation; stratigraphy, the study of the succes- ve layers of rock which form the earth's ust; petrography, the science of rock identifi- ıtion; mineralogy, which deals with the phys- al and chemical properties of minerals and eir classification; geomorphology, the study the structure of the earth's surface; and ructural geology, the study of the internal ructure of rocks. About one-tenth of the ırveyed geologists checked "Geology, gen- al" in filling out the questionnaire, to dicate that they did not consider themselves pecialists in any one branch of the science able 6).

Among the graduate students of geology in e survey, the proportion checking "Geology, eneral" (two-fifths of those reporting) was onsiderably higher than in the case of the xperienced geologists. Evidently many of ese students had not progressed far enough their studies to consider themselves spe- alists in any branch of geology. The students eporting a specialty most often checked etroleum and natural gas, but the proportion ho were specialists in this field was only 15 ercent, far smaller than among the expe- enced geologists. Nearly as many of the students (13 percent) were specializing paleontology, and fairly sizable groups (8 p cent in each case) regarded themselves specialists in stratigraphy or petrography. doubt, some of the graduate students major in these fields and some of those with specialties will subsequently enter employm in the petroleum industry and thus becc specialists in petroleum and natural gas p duction. Another reason why the proportion this specialty is so much higher among perienced geologists than among gradu students is that the petroleum industry is far the largest field of employment for p sons with only undergraduate training in science.

All major fields of specialization so discussed include a number of subspeci ties. Table A-2 in the appendix shows number of respondents who considered the selves most competent in each of the vari subspecialties listed on the survey questi naire.

AGE AND EDUCATIONAL BACKGROUNI

Age

Because the profession of geology has ha marked growth in recent years, the major of its members are young. The median of those surveyed was 35 years in 1951. T out of every three were under 40, and o about 1 out of 12 had reached 55, as sho by the following percentages:

Age group	Percent
All ages	100.0
Under 25 years	3.6
25 - 29 years	22.1
30 - 34 years	22.8
35 - 39 years	16.3
40 - 44 years	10.5
45 - 49 years	9.4
50 - 54 years	7.0
55 - 59 years	4.1
60 - 64 years	2.6
65 years and over	1.6

Of the various groups of specialists, oldest were the mineralogists and geom phologists (whose median ages were 41 40 years, respectively), but these two grou together comprised only 3 percent of the porting geologists. The specialists with lowest median ages (35 years in each ca were those in petroleum and natural g stratigraphy, and "other" specialties, chie engineering geology. The respondents who not specialized had a median age of 34 yea and were the only group younger than average for the profession as a whole (appe dix table A-3).

evel of Education

Despite increasing emphasis on graduate aining in geology, as in other sciences, the chelor's degree was the highest degree held the majority (55 percent) of the surveyed ologists. Twenty-five percent had master's grees and 17 percent had attained the ctorate. Only 3 percent were without college grees.

A comparison of the fields of specialization the Ph.D.'s with those of the geologists who d had less formal education shows one arked difference: a much smaller proportion the Ph.D.'s (22 percent) than of the masters 9 percent) or bachelors (76 percent) were ecialists in petroleum and natural gas. On e other hand, relatively more of the Ph.D.'s an of the geologists with less academic aining had specialized in economic geology d the other, more academic specialties (as own in appendix table A-4a).[3]

Another difference between the geologists th doctorates and those with less advanced grees was the higher median age of the rmer--45 years compared with 34 years for th masters and bachelors (appendix table 5a). This wide difference may be explained part by the decline in the number of ctorates awarded in the field during World ar II and the immediate postwar period, as ll as the entry into the profession since the r of large numbers of new graduates with ly bachelor's or master's degrees. The small oup of geologists who did not have college grees also had a high median age (44 years); ost of this group established themselves in e profession at a time when there was less mphasis than at present on formalized educa- on as a prerequisite for professional status. aduate students had a median age of 27 years ppendix table A-5b).

elds of Education

Although most of the surveyed geologists 7 percent) had taken their highest degrees that science, a sizable group had majored other physical sciences or in engineering. e 12 percent with majors in such fields had ost often specialized while in college in troleum, geological mining, or metallurgical gineering. Only 1 percent of the college- ained geologists had majored in nonscientific lds, including education and the social iences and humanities.

The proportion of geologists who had majored geology was even higher among the Ph.D.'s d masters than among those with only an dergraduate education. The percentages were follows: Ph.D.'s, 94 percent; masters, 92 rcent; bachelors, 82 percent; and respondents with some college training but no degree percent. Both the bachelors and the geolog without college degrees included a substar number who had majored in engineering (pendix table A-6).

EMPLOYMENT AND INCOME

Fields of Employment

Most of the scientists who considered geo their general field of highest competence v employed in the profession in mid-1951. Si numbers were, however, employed in o sciences and in nonscientific fields, as following figures show:

Field of employment	Percer
Total	100.0
Geology	92.7
Other sciences	3.0
Nonscientific fields	2.8
Active duty in the Armed Forces in a nonscientific capacity	1.5

The proportion of geologists employed side the science was smallest (5 perc among those specializing in petroleum natural gas. It was higher (13 percent) an the geomorphologists than any other grou specialists, and highest of all (24 perc among the respondents who did not hav specialty. Sixteen percent of this latter gr were employed in nonscientific fields at time of the survey (appendix table A-7). geologists who did not regard themselve specialists included some Ph.D.'s engage teaching or other activities which cut acr specialty lines. However, the group appare included also a number of persons wit graduate training whose professional atta ment to geology was less than that of mos the others surveyed.

The information on employment and inc in the remainder of this chapter relates to scientists employed as geologists at time of the survey. In addition to 6,076 both regarded geology as their first speci and were employed in that profession, the cover 107 who listed geophysics as their f of highest competence and 11 whose f specialty was meteorology but who were wo ing as geologists in 1951.

Type of Employer

That most geologists are engaged in appli tions of the science is indicated by the proportion employed in private industry. T thirds of the earth scientists working geology in 1951 were in the crude petrol and natural gas industry. Another 7 per

rity (91 percent) of the geologists whose ary specialty was petroleum and natural The specialties in which the proportion of ge faculty members was highest (from hird to two-thirds) were paleontology, igraphy, petrography, mineralogy, geo-hology, and structural geology. More than rd of the respondents who checked "Geol-general" were also employed in colleges niversities--as teachers of introductory ses or courses in several areas of the ce. Government agencies were a signifi-source of employment for geologists in major specialties; more than half the alists in the "other" group and about ifths of those in economic geology government workers (appendix table

e emphasis on doctoral degrees in the iitment of college faculties is reflected e relatively large numbers of Ph.D.'s oyed in institutions of higher education. ges and universities employed half of urveyed geologists with Ph.D.'s, though one-eighth of the total number at all s of education. In contrast, the crude leum and natural gas industry, which oyed two-thirds of all the geologists, unted for only one-fifth of the Ph.D.'s ndix table A-9). Government agencies ise employed about one-fifth of the .'s, but only one-eighth of all sur-l geologists (Chart 3 and appendix A-9).

pendix table A-10 shows the age distribu-of the geologists in each major type of oyment. Those in colleges and universities a somewhat older group than those oyed by private industry or govern-.

tions Performed

e principal function of the majority (58 ent) of the geologists in the survey was arch or field exploration,[4] largely the r. Those engaged in administration, teach-or consulting work were the next largest ps (from 10 to 14 percent of the total ber). Relatively few were engaged in other s of activities, as indicated below:

Technical writing	1.1
Inspection	1.0
Other functions	.7

The crude petroleum industry employed the great majority of the geologists engaged in research or field exploration, administration, consulting, and production, and nearly half of those engaged in inspection. On the other hand, virtually all the teachers were, of course, employed by colleges and universities. Government agencies employed three-fourths of the technical writers, as well as two out of every five inspectors and smaller proportions of the geologists in other types of activities (appendix table A-11).

Field exploration was much more predominant in the activities of the geologists with only master's or bachelor's degrees than in those of the Ph.D.'s. This is because most positions involving chiefly field exploration are in private industry or government, where there is less emphasis on the Ph.D. than there is in the selection of college faculties. Conversely, the proportion of teachers was much higher among the Ph.D.'s than the respondents with less academic training (appendix table A-12).

A comparison of the median ages of the geologists in different types of activities shows that those in administrative positions--which are usually attained after many years of experience--were the oldest group. Their median age was 44 years. The median ages of the geologists whose main function was consulting or teaching were slightly lower (42 years and 41 years, respectively). In contrast, the research and exploration geologists had a median age of 33 years, and the groups primarily engaged in technical writing and in inspection work were even younger (appendix table A-13).

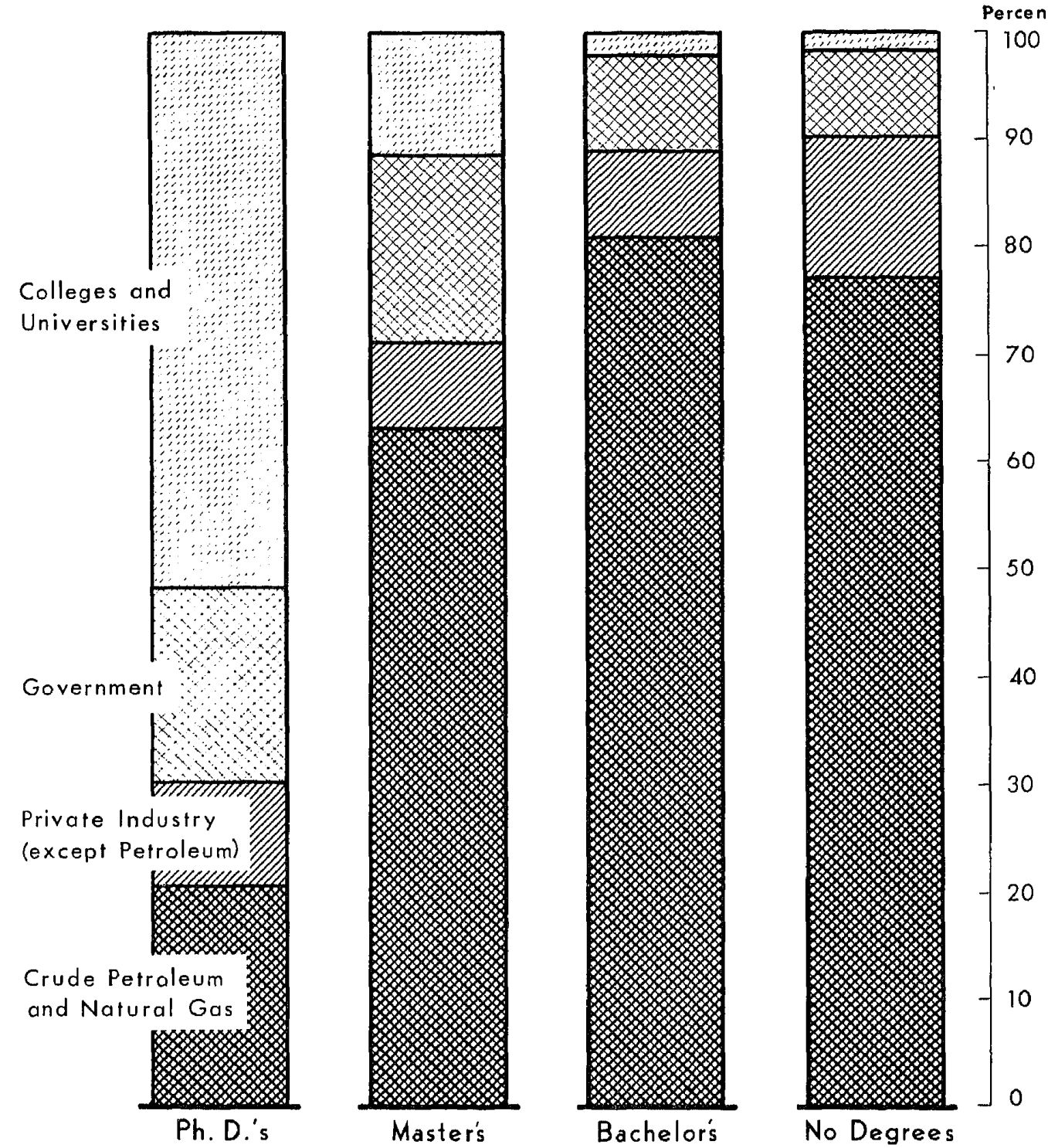
Professional Income

The median annual professional income of the geologists surveyed was $6,200 in 1951. Three out of every four earned at least $4,700 and one of four earned $9,100 or more. These figures represent total annual professional income including fees, royalties, and other professional earnings in addition to salaries. Income levels may have been somewhat higher among the surveyed geologists than in the profession generally, since the respondents in the survey were mostly society members and other studies have shown that the better-

survey questionnaire, which was designed to cover a num-scientific fields, showed "research, development, or field tion" as a single functional group in the checklist pro-

Chart 3. MOST GEOLOGISTS WITH PH. D.'S ARE EMPLOYED IN COLLEGES AND UNIVERSITIES - MOST OTHERS IN THE PETROLEUM INDUSTRY

Percent Distribution of Geologists by Industry, 1951



UNITED STATES DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS

Source: Appendix Table A-9

25 to $9,800 for those aged 55-59). It then fell to $8,400 for the group aged 65 or over, which probably included some who did not work full time (appendix table A-14).

Geologists employed in private industry have a substantially higher income level than those working for other types of employers. The median income of $6,700 for the respondents in private business compares with a median of $5,900 for those working in colleges and universities. A still lower over-all median ($5,200) was recorded for the surveyed geologists in government positions, who were a younger group and included relatively fewer

Geologists with master's degrees in ... and in government had some income adva... over those without graduate degrees, ... private industry, the surveyed bachelors ... higher median income than the masters ... few geologists without college degree ... higher average earnings than either the ma... or bachelors--undoubtedly indicating that ... respondents were a select group, whos... of the usual academic preparation was ... by long experience and other special fa... Detailed data on the incomes of geologi... each level of education are given in app... tables A-15 and A-16.

GEOPHYSICISTS

FIELDS OF SPECIALIZATION

The geophysical sciences apply the prin-
les and concepts of physics, mathematics,
l chemistry in the study of the earth, its
ters and atmosphere. They include a num-
r of more or less independent specialties--
ong others, geophysical exploration, for
, natural gas, or minerals; hydrology,
ncerned with such problems as the control
floods and soil erosion and the supply of
ter for power, irrigation, and personal
e; oceanography, the study of the ocean in
its aspects; seismology the study of earth-
akes; and geodesy, which involves the meas-
ement of the size and shape of the earth
l its gravitational force. There are also
veral small geophysical specialties, as
own in table 7.

Meteorology as indicated earlier, is often
garded as one of the geophysical sciences,
was treated separately in this survey.
e term "geophysicists," as used in this
port, therefore denotes scientists specializ-
in the various geophysical fields, exclusive
meteorology.

Geophysical exploration was the field of
ghest competence of the majority (53 per-
nt) of the surveyed geophysicists. Another
rth considered hydrology their first spe-
lty. The numbers who were specialists
seismology, oceanography, or other branches
geophysics or who did not regard themselves
specialists in any particular branch were
ch smaller.

Among the graduate students, the specialists
geophysical exploration were also the largest
oup (25 percent), although the proportion
ing this specialty was much smaller among
students than among the experienced geo-
ysicists. The second largest group of students
percent) were those who had not yet
come specialists and therefore checked
Geophysics, general" in the specialty check-
t on the questionnaire.

Besides indicating the broad areas of geo-
ysics in which they were specialists, many
spondents reported the subspecialties in
ich they were most competent. The numbers
all geophysical subspecialties listed on the
estionnaire are given in appendix table B-2.

AGE AND EDUCATIONAL BACKGROUND

e

Geophysicists, with a median age of 37
ars, were the oldest of the three groups
earth scientists in the survey.

Specialists in geophysical exploration had
median age of 36 years. Of the other groups
geophysical specialists, which were smaller
number, oceanographers had the lowest
edian age (34 years) and geodesists the
highest (44 years), as shown in appen
table B-3.

The 37 women geophysicists in the sur
tended to be younger than the men; th
median age was 32 years. Graduate stude
had a median age of 27 years.

The relative numbers of geophysicists
different age groups were as follows:

Age group	Percent
All ages	100.0
Under 25 years	3.8
25 - 29 years	18.4
30 - 34 years	18.7
35 - 39 years	18.6
40 - 44 years	18.6
45 - 49 years	10.5
50 - 54 years	5.6
55 - 59 years	2.6
60 - 64 years	1.8
65 years and over	1.4

Level of Education

For geophysicists, as for geologists, m
of the positions available involve practi
applications of the science in industry or
governmental activities. The fact that s
positions can often be entered without advan
academic training is indicated by the la
proportion of the surveyed geophysicists
percent) who did not have graduate degre
Eleven percent did not hold any college degr
as shown by the following figures:

Highest degree held	Percen
Total	100.0
Ph.D.	11.6
Master's	18.6
Bachelor's	58.9
No degree but some college training	9.2
No college training	1.7

The geophysicists without graduate trair
were, to a large extent, specialists in
applied fields of geophysical exploration
hydrology (appendix table B-4). The larg
numbers of Ph.D.'s and masters were a
in these two fields, although the proporti
employed there were not as large as in
case of the respondents without gradu
degrees. Relatively more of the gradua
trained scientists than of those with l
academic preparation were in the oth
smaller specialties.

Geophysicists with Ph.D.'s had a med
age of 44 years, compared with 37 for th
with master's degrees and 36 for those wh
highest degree was the baccalaureate (apper
table B-5). This spread in median ages betw
the Ph.D.'s and the masters and bachelo
like the even greater difference noted am

Less than a fifth of the geophysicists had majored in geophysics or physics in taking their most advanced training. The large number who had majored in related fields reflects the fact that relatively few colleges and universities grant degrees in geophysics. Thirty-seven percent reported majors in engineering, 28 percent in geology, and smaller numbers in other physical sciences. Those who held only bachelor's degrees had most frequently majored in engineering. Most respondents with advanced degrees, on the other hand, had taken these degrees in geophysics, physics, or geology (appendix table B-6).

EMPLOYMENT AND INCOME

Fields of Employment

Geophysics, which developed from geology and physics, also draws upon mathematics, chemistry, and engineering for knowledge and techniques and contributes to the solution of many problems of concern to scientists in these fields. In consequence, some scientists whose primary specialization is in geophysics are to be found working in positions classified in other disciplines. Thus, 4 percent of the respondents whose first specialty was in geophysics were working in geology; another 4 percent were in engineering, chiefly civil engineering; and still smaller numbers were in other fields. Nevertheless, the great majority (86 percent) held positions in geophysics at the time they filled out the questionnaire, and most were employed in the particular branches of geophysics in which they had greatest competence. Thus 9 out of every 10 specialists in geophysical exploration were actually engaged in that type of work, and 8 out of 10 hydrologists held jobs in that field. In some of the smaller specialties, relatively fewer geophysicists were employed in their primary fields, but the proportion so employed was well over half in all specialties (appendix table B-7).

The data on employment and earnings in geophysics which follow relate only to persons employed in geophysical activities at the time of the survey. Scientists with first competence in geophysics who held other scientific or nonscientific positions have been excluded. On the other hand, the figures include a small group of earth scientists who listed geology or meteorology as their field of highest competence but who were engaged in geophysical work.

percent) worked for government ag
principally those of the Federal Gover
Another 8 percent were on college and u
sity staffs and small groups were ir
types of employment (table 8).

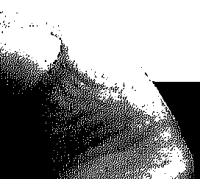
A close relationship was noted betw
geophysicists' specialties and the indu
in which they were employed, althou
available information does not indic
what extent their specialties determi
grew out of their employment expe
Thus, 9 out of 10 of the specialists i
physical exploration and nearly half
seismologists were employed in the pet
industry, whereas nine-tenths of the hy
gists, three-fourths of the geodesists
two-thirds of the experts in terr
magnetism, and half the oceanographers
for government agencies. The special
which college and university employme
of greatest relative importance were,
the combined field of volcanology, geoche
and petrology and, second, oceanograp
pendix table B-8).

The concentration of Ph.D.'s in colle
universities is less in this than in othe
sciences. College faculty members com
38 percent of the geophysicists with doct
compared with 52 percent of the geo
holding Ph.D.'s. Government agenci
the crude petroleum industry employe
tively more of the geophysicists with m
degrees than of those with doctorates.
geophysicists who did not hold gr
degrees, the petroleum industry was
the largest field of employment (ap
table B-9).

Geophysicists in private industry a
the average, somewhat younger than
employed by colleges and universit
government agencies. The median
the respondents in private industry
years, compared with 38 years for
in colleges and universities and 39
for Federal employees (appendix table

Functions Performed

The predominance of geophysical ex
tion as a field of employment for me
of this profession is shown, once ag
information on the types of activities in
the respondents were engaged. Fifty-si
cent reported that their primary f
was research or field exploration.
physicists chiefly employed in administ
the second largest group, represente



percent of the reporting scientists. The mbers engaged in production or other types activities were much smaller still, as shown the following figures:

Function performed	Percent
All functions	100.0
Research and field exploration	56.4
Administration	21.3
Production and operation	9.0
Teaching	4.7
Consulting	4.5
Design	1.3
Technical writing	1.1
Inspection	.8
Other functions	.9

The crude petroleum industry employed the jority of the geophysicists in all these ctional groups except four small ones. e exceptions were teaching, of course done inly in colleges and universities, and design, hnical writing, and inspection, all of which re done chiefly by government employees pendix B-11).

Research and field exploration were the in activities of the largest group of geo-ysicists with doctorates (47 percent) and more than half of those with less academic ining. Among the Ph.D.'s in this profession, chers were the second largest group (28 rcent)--contrary to the situation among ologists with doctorates, of whom the largest mber were engaged in teaching and the cond largest in research and field explora-n. Administration was the function which nked next to research and field exploration the activities of geophysicists with only ster's or bachelor's degrees or an incom-te college education (appendix table B-12).

Geophysicists engaged in research and oloration were a younger group than those most other types of activities. Their median e was 34 years, 3 years below the overall dian for the profession as a whole. Geo-ysicists in administrative activities were oldest functional group, with a median e of 43 years (appendix table B-13).

ofessional Income

A median income of $6,500 for 1951 was corded for the surveyed geophysicists. Three of four earned more than $5,000, and the -paid fourth made over $8,000. Like all er income figures in this report, these ta represent total annual professional income d include fees, royalties, and other supple-ntary professional earnings as well as laries. They may somewhat overstate 1951 income levels in the geophysics profess as a whole, since almost all the surve geophysicists were professional society me bers and, as previously indicated, the low paid members of a profession are less lik to join a society than the higher-paid ones.

A pattern of income increases with incre ing age, similar to that noted for the geo gists, was found for geophysicists. Med incomes rose steadily--from $4,200 for th under 25 years of age to $8,900 for th in the 55-59 year age group. They decli thereafter--to $8,300 for those aged 65 over, the oldest group in the survey (apper table B-14).

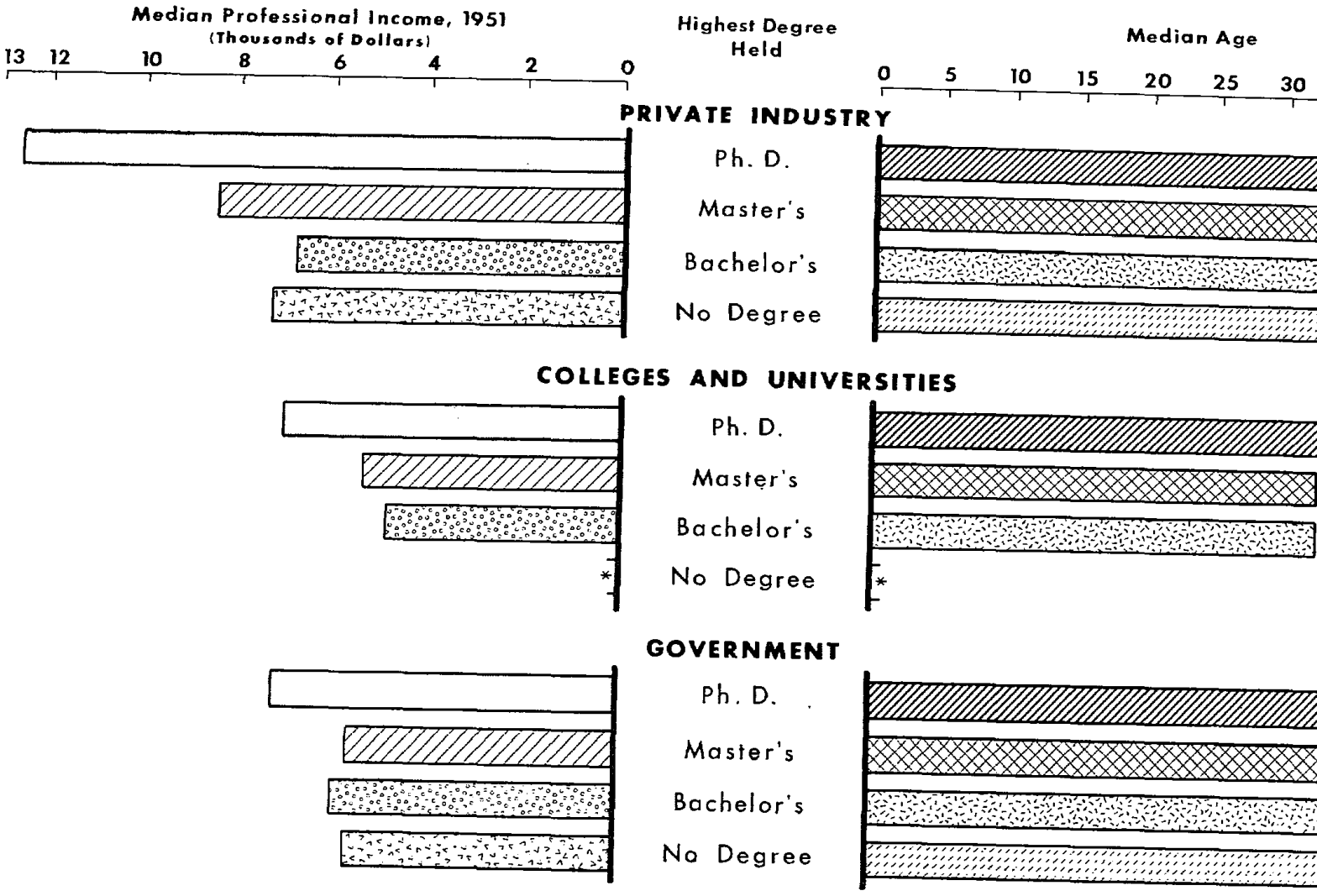
In geophysics as in geology and many ot professions, earnings tend to be higher private industry than in other types of empl ment. Median income was found to be $7, in 1951 for geophysicists in private indus compared with $5,800 both in colleges universities and in government agencies.

In each of these three major types of ploymont, Ph.D.'s had markedly higher aver incomes than scientists with less advan training. Geophysicists with master's degr however, do not have a consistent inc advantage over those with less academic tra ing. In private industry and university empl ment, the masters had higher income le than the bachelors, but in government agenc the bachelors in the survey, many of t engineers, had a slightly higher median come than the masters. Moreover, in pri industry the small group of geophysic without college degrees, many of them o and probably in supervisory positions, ea more than the bachelors.

These deviations from the usual di relationship between level of education income were probably due largely to ferences in age and experience, another imp tant factor in income determination. Cha which shows median incomes by leve education and type of employer, also indic the median ages of each group. It will be that the geophysicists in private industry did not have college degrees were an o group than the bachelors employed th and that the government employees with degrees only tended to be older than t with master's degrees. Another reason the relatively high average earnings of government geophysicists was that man them were engaged in engineering activit where earnings tend to be above those in m other aspects of geophysical work.

More detailed data on the income of physicists at each level of education given in appendix table B-16.

Chart 4. GEOPHYSICISTS WITH PH. D.'S ARE OLDER AND EARN MORE THAN TH
WITH LESS ACADEMIC TRAINING



FIELDS OF SPECIALIZATION

Meteorologists, who study the atmosphere d its phenomena, are for the most part ecialists in synoptic meteorology, the branch the science concerned with the interpretation weather observations and with weather ecasting. Nearly three-fourths of the mete- ologists surveyed regarded this specialty their field of highest competence. Small oups (4 percent or less) cited other spe- lties such as climatology, the analysis of ather records for a specific region, and ysical and dynamic meteorology, research lds which study the physical laws governing movements and temperature changes. Thir- n percent checked "Meteorology, general," licating that they did not regard themselves specialists in any one branch (table 9).

Synoptic meteorology was the specialty most en reported by the graduate students also, the proportion specializing in this field percent) was considerably lower among students than among the professional teorologists. On the other hand, there were latively more students than experienced entists in other specialties, and also a eater proportion who had not yet become ecialists in any branch of the science.

Meteorology subspecialties were also re- rted by a great many of the respondents. e number of meteorologists in the various ospecialties are shown in table C-2 of the pendix section of this report.

AGE AND EDUCATIONAL BACKGROUND

e

Meteorologists are the youngest of the three oups of earth scientists. The median age those surveyed was 34 years in 1951, com- red with 35 for geologists and 37 for geo- ysicists. The number nearing retirement e was extremely small, as shown by the lowing figures:

Age group	Percent
All ages	100.0
Under 25 years	3.5
25 - 29 years	17.5
30 - 34 years	35.2
35 - 39 years	20.6
40 - 44 years	12.2
45 - 49 years	6.4
50 - 54 years	2.5
55 - 59 years	1.2
60 - 64 years	.5
65 years and over	.4

These overall figures mainly portray the e distribution of the synoptic meteorologists, o comprise the majority of the profession. spondents in this specialty had the same median age as that for all surveyed me orologists (34 years). Climatologists were oldest group of specialists (with a median of 42 years), but they were few in num (appendix table C-3).

The women meteorologists in the sur tended to be somewhat younger than the m The median age of these 91 women was years.

Level of Education

Meteorology, like other earth sciences, to a considerable extent an applied scien Partly for this reason, it has been possi for a considerable number of persons to att professional status in the science thro practical experience and on-the-job traini although academic training has been emp sized increasingly in recent years. Nea one-third of the meteorologists in the sur did not have any college degree--a considera higher proportion than among either geologi or geophysicists. Most of these meteorologi had, in all probability, achieved professio competence through subprofessional expe ence in weather forecasting in the Arr Forces or the United States Weather Burea Nevertheless, a large majority of the respo ents (69 percent) had at least the bachelo degree, and more than a fifth held gradu degrees. A few (4 percent) had doctorates.

Because employment opportunities for me orologists without graduate training are chi in synoptic meteorology, most such meteoro gists become specialists in this field. Thr fourths of the bachelors in the survey more than four-fifths of the respondents with college degrees regarded synoptic meteorol as their field of highest competence, compa with little more than half of the masters less than one-fifth of the Ph.D.'s. The larg group of Ph.D.'s (30 percent) were speciali in dynamic meteorology (appendix table C-

The median age of the meteorologists v Ph.D.'s was 37 years, compared to 35 ye for those with master's degrees and 34 those in other educational groups (.ppen table C-5). The lower median age of Ph.D.'s in this profession than of those other earth sciences reflects the fact that m of the meteorologists with Ph.D.'s recei their doctorates since World War II.

Fields of Education

Many professional meteorologists entered the field through experience as weat

[5] The respondents without bachelor's degrees apparently inc a few persons who, although members of the American Meteor ical Society and thus in the survey mailing list, had not ach full professional status in the science. However, the employ and income data indicate that this subprofessional group repres only a small proportion of those who did not hold college degree

bservers in the Armed Forces or the Weather ureau had received their academic training other subjects. Altogether, only 30 percent the college-trained meteorologists in the rvey majored in meteorology in studying r their highest degrees. The proportions th majors in other subjects were: physical iences other than meteorology, 36 percent; cial sciences, 14 percent; engineering, 11 rcent; agricultural and biological sciences, percent; and other subjects, mainly liberal ts, 6 percent.

Academic training in meteorology was reorted by a much higher proportion of the espondents with graduate degrees than of ose with less formal education. Those who d majored in meteorology represented 62 rcent of the Ph.D.'s and 59 percent of the asters but only 20 percent of the bachelors. nly 25 percent of the respondents with some llege training but no degree had majored meteorology. Both this group and the chelors had most often specialized while in llege in other physical sciences or engineerg (appendix table C-6).

EMPLOYMENT AND INCOME

ields of Employment

Scientists who consider meteorology their eneral field of highest competence hold jobs that profession in the great majority of ases. Nevertheless, a sixth of those surveyed ere working in other fields in 1951--a higher ate of employment outside the scientists' rimary specialty than was found in several ther professions surveyed by the National cientific Register. Six percent were working other sciences and 12 percent in nonscientific fields. The respondents in other elds of employment undoubtedly included a onsiderable number who received their trainng in meteorology during World War II and aintained a professional interest in the field lthough they did not obtain civilian employent in it.

Specialists in the particular branches of eteorology were, to a large extent, employed those branches. Thus, three-fourths of e specialists in synoptic meteorology, the argest group in the survey, held jobs in that anch of the science. More than half of those each of the other specialties were employed their respective fields (appendix table C-7).

The information on employment and income the remainder of this summary relates only persons employed in meteorology. The 17 ercent of the surveyed meteorologists who eld positions outside the profession have been xcluded from all following statistics.

ype of Employer

The United States Government is the major mployer of meteorologists in this country (chart 5). Four out of every five of the survey scientists with jobs in meteorology we Federal employees, working in most cases f the Weather Bureau of the Department of Cor merce or in military and civilian positions the Navy and Air Force. Commercial airlin and colleges and universities employed mo of the other meteorologists (table 10).

In all but one of the meteorological sp cialties for which separate figures were o tained, the Federal Government was the pr dominant employer. Colleges and universiti employed more than two-fifths of the met orologists in dynamic and in physical met orology, both of which are research specialti (appendix table C-8). The government was al the principal employer of meteorologists each educational group except the Ph.D. of whom two-thirds were college faculty me bers (appendix table C-9).

In this profession as among the geologis and geophysicists, the government employe were somewhat older, on the average, than t respondents in private industry and educatio institutions (appendix table C-10).

Functions Performed

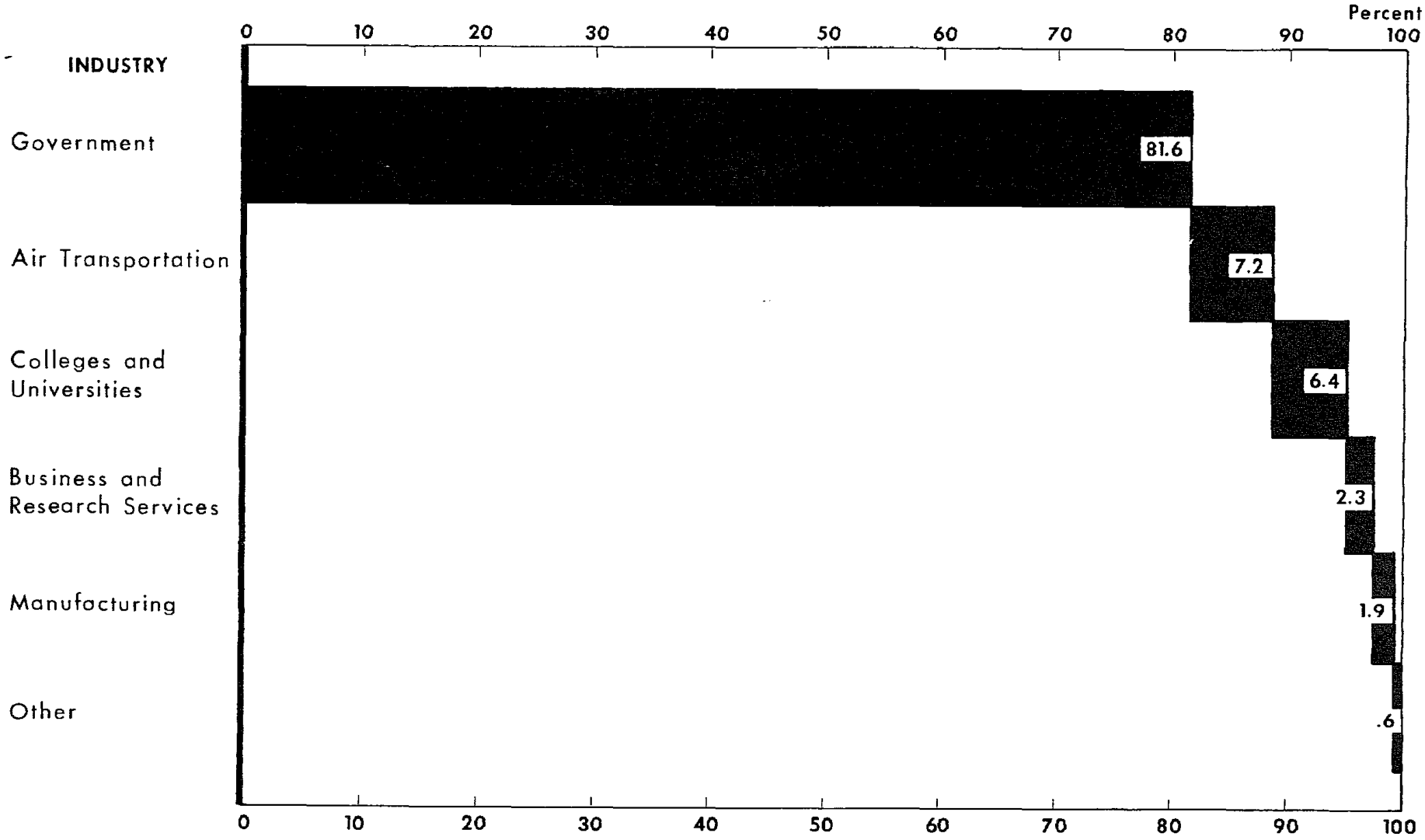
Operational activities, connected w weather observation and forecasting in weath stations and offices, are the chief function most meteorologists. Nearly two-thirds of employed meteorologists in the survey we principally engaged in operational or relat work at the time they filled out their questio naires. Management or administration w the primary function of another 12 perce and about the same proportion were resear workers. Much smaller numbers were e ployed in teaching or other activities, indicated by the following figures:

Function performed	Percent
Total	100.0
Operation and related activities	64.1
Management and administration	12.3
Research	11.9
Teaching	4.8
Consulting	3.2
Inspection	1.5
Other	2.2

Nine out of 10 of the meteorologists engag in operational or administrative activities we employed by the Federal Government, althou commercial airlines also employed a few these types of work. Three-fifths of the me orologists in research activities were a government workers, as were more tha fourth of those engaged in teaching. Colleg and universities employed more than tw thirds of the teachers and almost a fourth the research workers in the survey (appen table C-11).

Chart 5. GOVERNMENT IS THE PRINCIPAL EMPLOYER OF METEOROLOGISTS

Percent Distribution of Meteorologists by Industry, 1951



UNITED STATES DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS

Source: Appendix Table C-8

Meteorologists without advanced academic raining are the ones most often engaged in perational activities. Four-fifths of the sur-eyed scientists who did not have college egrees were employed in such work, compared vith two-thirds of the bachelors, one-third f the masters, and only 1 percent of the Ph.D.'s. The proportion engaged in research, n the other hand, was highest among the cientists with the most advanced training--ising from 2 percent of the meteorologists vithout college degrees to half of those with octorates. The proportion of teachers was, ikewise, much higher among those with Ph.D.'s nd master's degrees than among the respond-nts with less formal education (appendix able C-12).

Administrative positions in meteorology, s in the other earth science professions, re held mainly by persons in the older age roups. The median age of 41 years for mete-rologists in administrative jobs compares vith a median age of 34 years for those in ost other types of activities (appendix table -13).

Professional Income

The median professional income of the urveyed meteorologists was $5,100 in 1951, ndicating a considerably lower income level han was found for geologists or geophysicists.

The overall income figures for meteorol gists reflect, to a great extent, the earnin of the large numbers holding Governme positions in the lower professional grades relatively few of whom had had advanced trai ing. Considerably higher earnings were r ported by the meteorologists in private indust and by Ph.D.'s in colleges and universiti and government agencies (appendix table C-1

A comparison of the median income figur for meteorologists by progressive age grou indicates that the peak of earnings ($5,50 was reached in the comparatively young gro 40-44 and remained at this level in the old age groups (appendix table C-15). This findi is undoubtedly explained by the limitations salaries in government meteorological pos tions.

Additional information on the incomes meteorologists at each level of education given in table C-16 in the appendix.

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[6] A survey by the U. S. Civil Service Commission in June 1 showed that 72 percent of the meteorologists working for the Fede Government held positions classified in grades GS-7 or GS-9 which the minimum salaries were then $3,825 and $4,000 resp tively. Salaries in these as in other grades of positions in the gove ment service have since been increased by approximately 10 perc (Federal White-Collar Workers--Their Occupations and Salari June 1951, Bulletin No. 1117, U. S. Department of Labor, Bureau Labor Statistics, Washington 25, D. C., 1953, Table C, pp. 36 The average salary of Weather Bureau meteorologists has a increased since the date of the survey as a result of a reclassifica program in the Bureau.

TABLE 1. --Level of education of men and women earth scientists, by major field of highest competence, 1951

Highest degree held	Geologists		Geophysicists		Meteorologists	
	Men	Women	Men	Women	Men	Women
Total number reporting[1]	6,336	191	2,859	37	2,557	80
Total percent reporting	100.0	100.0	100.0	100.0	100.0	100.0
Ph.D. degree	17.0	16.2	11.7	2.7	4.5	3.7
Master's degree	25.0	34.0	18.5	29.7	17.5	12.5
Bachelor's degree	55.0	48.7	58.8	62.2	47.3	36.3
No degree	3.0	1.1	11.0	5.4	30.7	47.5

[1] Excludes the following not reporting level of education: 35 geologists, 40 geophysicists, and 182 meteorologists. Also excludes 2 meteorologists with degrees other than those listed.

Table 2. --Military status of all men earth scientists and of those under 35 years of age, 1951

Military status	All ages			Under 35 years		
	Geologists	Geophysicists	Meteorologists	Geologists	Geophysicists	Meteorologists
Total number reporting[1]	6,206	2,821	2,669	3,030	1,168	1,509
Total percent reporting	100.0	100.0	100.0	100.0	100.0	100.0
On active duty	2.0	3.3	16.7	3.4	4.7	21.3
In reserve forces	29.0	21.8	31.8	43.3	35.1	40.7
No present military status	69.0	74.9	51.5	53.3	60.2	38.0

[1] Excludes 165 geologists, 78 geophysicists, and 61 meteorologists who did not report age or military status.

TABLE 3. --Citizenship status of earth scientists, 1951

Citizenship status	Geology	Geophysics	Meteorology
Total number reporting[1]	6,545	2,922	2,806
Total percent reporting	100.0	100.0	100.0
Citizen	98.9	98.4	99.5
Native born	96.4	94.3	97.1
Naturalized	2.5	4.1	2.4
Alien	1.1	1.6	.5
In process of naturalization	.5	.7	.3
Not in process of naturalization	.6	.9	.2

[1] Excludes 17 geologists, 14 geophysicists, and 15 meteorologists not reporting citizenship status.

TABLE 4. --Fields of employment and major fields of highest competence of earth scientists, 1951

Field of employment	Field of highest competence							
	Total		Geology		Geophysics		Meteorology	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total reporting	[1] 12,307	100.0	6,558	100.0	2,936	100.0	2,813	100.0
Geology	6,194	50.3	6,076	92.7	107	3.7	11	.4
Geophysics	2,653	21.5	110	1.7	2,511	85.5	32	1.1
Meteorology	2,336	19.0	2	1.3	13	.4	2,321	82.5
Other sciences	390	3.2	87	--	192	6.5	111	4.0
Nonscientific fields	734	6.0	283	4.3	113	3.9	338	12.0

[1] Excludes 12 unemployed--4 in geology and 8 in meteorology.

TABLE 5.--Median annual professional income of earth scientists, by level of education and type of employer, 1951

Type of employer	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No colle degre
	Geologists				
types of employers[1]	$6,200	$7,200	$5,500	$6,000	$6
vate industry	6,700	10,500	6,200	6,500	8
leges and universities	5,900	6,700	4,200	4,000	(2)
ernment	5,200	6,700	4,800	4,600	(2)
	Geophysicists				
types of employers[1]	6,500	8,100	6,200	6,300	6
vate industry	7,300	12,600	8,500	6,800	7
lages and universities	5,800	7,000	5,300	4,800	(2)
ernment	5,800	7,100	5,500	5,800	5
	Meteorologists				
types of employers[1]	5,100	6,800	5,600	5,300	4
vate industry	5,800	(2)	6,100	5,700	5
loges and universities	5,500	6,600	4,600	(2)	(2)
ernment	5,000	7,400	5,700	5,200	4

[1] Includes certain types of employers not shown separately because the numbers of earth scientists working for them were
nely small.
[2] Too few cases to permit computation of medians.

TABLE 6.--Fields of highest competence of geologists and graduate students, 1951

Field of highest competence	Geologists		Graduate students	
	Number	Percent	Number	Percent
al	6,562	100.0	706	1
roleum and natural gas	4,085	62.3	102	
nomic geology	523	8.0	43	
eontology	380	5.8	90	
atigraphy	231	3.5	55	
rography	129	2.0	54	
eralogy	106	1.6	20	
morphology	90	1.4	19	
uctural geology	88	1.3	29	
er geological specialties	259	3.9	8	
logy, general	671	10.2	286	

TABLE 7. --Fields of specialization of geophysical scientists and graduate students, 1951

Field of specialization	Geophysical scientists		Gradua
	Number	Percent	Number
All fields	2,936	100.0	14
Geophysical exploration	1,555	53.0	
Hydrology	694	23.6	
Oceanography	156	5.3	
Seismology	140	4.8	
Geodesy	115	3.9	
Volcanology, geochemistry and petrology	89	3.0	
Terrestrial magnetism and electricity	66	2.3	
Tectonophysics	17	.6	
Geophysics, general	104	3.5	

TABLE 8. --Type of employer of geophysicists, 1951

Type of employer	Number
All employers	[1] 2,65
Crude petroleum and natural gas extraction	1,43
Government	79
Colleges and universities	21
Research and consulting services	11
Manufacturing	6
Mining	2
Other industries	1

[1] Excludes 1 geophysicist who did not report type of employer.

TABLE 9.--Fields of specialization of meteorologists and graduate students, 1951

Field of specialization	Meteorologists		Graduate students	
	Number	Percent	Number	Percent
All fields	2,821	100.0	88	100.0
Synoptic meteorology	2,020	71.6	43	48.8
Climatology	120	4.3	5	5.7
Experimental and instrumental meteorology	94	3.3	6	6.8
Dynamic meteorology	84	3.0	7	8.0
Physical meteorology	55	1.9	2	2.3
Upper atmosphere	37	1.3	3	3.4
Micrometeorology	27	1.0	1	1.1
Cosmical and radio meteorology	17	.6	2	2.3
Meteorology, general	367	13.0	19	21.6

TABLE 10.--Type of employer of meteorologists, 1951

Type of employer	Number	Percent
Total	[1] 2,334	100.0
Government	[2] 1,904	81.6
Air transportation	167	7.2
Colleges and universities	150	6.4
Research and consulting services	54	2.3
Manufacturing	44	1.9
Other	15	.6

[1] Excludes 2 meteorologists who failed to report type of employer.
[2] Includes 5 employees of State and local governments.

APPENDIX A

GEOLOGY

Age group	Total	On active duty	In reserve forces	No present military status		
				Total	Veteran	Non-veteran
	Number					
ages	[1] 6,206	122	1,801	4,283	1,810	2,4
25 years	406	39	104	263	175	
21 years	7	2	--	5	--	
22 years	23	2	7	14	--	
23 years	59	14	12	33	6	
24 years	118	12	31	75	54	
25 years	199	9	54	136	115	
34 years	2,624	63	1,208	1,353	985	3
26 years	229	11	92	126	110	
27 years	303	7	114	182	156	
28 years	334	11	139	184	161	
29 years	310	8	138	164	137	
30 years	357	6	193	158	131	
31 years	311	8	166	137	102	
32 years	261	4	141	116	65	
33 years	270	4	125	141	69	
34 years	249	4	100	145	54	
39 years	1,023	9	308	706	148	5
44 years	652	3	86	563	67	4
49 years	579	6	57	516	27	4
54 years	428	2	27	399	161	2
59 ysars	248	--	10	238	173	
64 years	158	--	1	157	63	
ears and over	88	--	--	88	11	
	Percent					
ages	100.0	2.0	29.0	69.0	29.2	39
25 years	100.0	9.6	25.6	64.8	43.1	21
21 years	([2])	([2])	--	([2])	--	([2]
22 yesrs	100.0	8.7	30.4	60.9	--	60
23 ysars	100.0	23.7	20.4	55.9	10.2	45
24 ysars	100.0	10.2	26.3	63.5	45.7	17
25 yesrs	100.0	4.5	27.1	68.4	57.8	10
34 years	100.0	2.4	46.0	51.6	37.6	14
26 yesrs	100.0	4.8	40.2	55.0	48.0	7
27 yesrs	100.0	2.3	37.6	60.1	51.5	8
28 years	100.0	3.3	41.6	55.1	48.2	6
29 years	100.0	2.6	44.5	52.9	44.2	8
30 years	100.0	1.7	54.1	44.2	36.7	7
31 years	100.0	2.6	53.4	44.0	32.8	11
32 years	100.0	1.5	54.0	44.5	24.9	19
33 ysars	100.0	1.5	46.3	52.2	25.6	26
34 years	100.0	1.6	40.2	58.2	21.7	36
39 years	100.0	.9	30.1	69.0	14.5	54
44 years	100.0	.5	13.2	86.3	10.3	76
49 ysars	100.0	1.0	9.8	89.2	4.7	84
54 years	100.0	.5	6.3	93.2	37.6	55
59 years	100.0	--	4.0	96.0	69.8	26
64 years	100.0	--	.6	99.4	39.9	59
ears and over	100.0	--	--	100.0	12.5	87

Excludes 125 not reporting military status; 34 who listed a military status other than those listed here, such as Fleet rve; 5 not reporting age; and 1 not reporting military status and age.
Too few cases to permit computation of percentages.

TABLE A-1b. --Military status of men graduate students of geology, by age, 1951

Age group	Total	On active duty	In reserve forces	No military status		
				Total	Veteran	Nonveteran
All ages	[1] 676	10	206	460	307	153
20 - 25 years	305	7	63	235	118	117
20 years	—	—	—	—	—	—
21 years	5	—	—	5	—	5
22 years	41	2	8	31	1	30
23 years	87	2	17	68	9	59
24 years	79	—	17	62	43	19
25 years	93	3	21	69	65	4
26 - 34 years	350	3	134	213	180	33
26 years	72	—	24	48	40	8
27 years	51	—	15	36	32	4
28 years	68	1	21	46	39	7
29 years	41	—	21	20	16	4
30 years	45	1	18	26	20	6
31 years	33	1	15	17	16	1
32 years	19	—	11	8	7	1
33 years	18	—	8	10	9	1
34 years	3	—	1	2	1	1
35 - 39 years	17	—	8	9	6	3
40 years and over	4	—	1	3	3	—

[1] Excludes 5 not reporting military status; 3 who listed a military status other than those listed here, such as Fleet Reserve; 1 not reporting age; and 1 not reporting military status and age.

Field of highest competence	Number	Percent
fields	6,562	[1]
roleum and natural gas	4,085	
ubsurface geology	1,683	
urface field exploration	555	
il field development	364	
ther specialties	6	
etroleum and natural gas, general	1,477	
nomic geology	523	
etallic ores	246	
onmetallic deposits	109	
ther specialties	1	(2)
conomic geology, general	167	
eontology	380	
icropaleontology	160	
aleontology, invertebrate	88	
aleontology, vertebrate	58	
aleobotany, paleoecology	27	
aleontology, general	47	
etigraphy	231	
hysical stratigraphy and sedimentation	100	
istorical geology	65	
tratigraphy, general	66	
rography	129	
edimentary	36	
gneous	19	
etamorphic	4	
ther specialties	3	(2)
etrography, general	67	
eralogy	106	
eterminative mineralogy	40	
ther specialties	3	(2)
ineralogy, general	63	
morphology	90	
iving glaciers; glacial geology	31	
rctic; coastal regions	2	(2)
rid deserts	2	(2)
ther specialties	5	
eomorphology, general	50	
uctural geology	88	
edimentary rocks	33	
gneous and metamorphic rocks	18	
tructural geology, general	37	
er geological specialties	259	
ngineering geology	177	
hotogeology	48	
ilitary geology	25	
ineral economics	9	
logy, general	671	

Totals may not add because of rounding.
Less than 0.05 percent.

TABLE A-3. --Age distribution and median age of geologists, by field of highest competence, 1951

Age group	All fields	Petroleum and natural gas	Economic geology	Paleontology	Stratigraphy	Petrography	Mineralogy	Geomorphology	Structural geology	Other geological specialties	Geology, general
	Number										
All ages.....	[1] 6,556	4,081	523	380	230	129	106	90	88	259	670
Under 25 years.....	237	144	16	9	5	4	2	--	2	8	47
25 - 29 years.....	1,447	957	69	52	58	22	14	14	18	51	192
30 - 34 years.....	1,496	976	111	81	52	32	19	17	17	67	124
35 - 39 years.....	1,068	705	84	60	33	21	15	13	18	48	71
40 - 44 years.....	690	409	78	55	25	16	13	13	4	32	45
45 - 49 years.....	613	362	46	49	25	11	14	19	15	21	51
50 - 54 years.....	459	271	41	33	15	10	13	2	5	11	58
55 - 59 years.....	270	150	33	18	10	5	6	7	3	6	32
60 - 64 years.....	171	78	17	17	5	4	4	4	4	10	28
65 years and over...	105	29	28	6	2	4	6	1	2	5	22
	Percent										
All ages.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 25 years.....	3.6	3.5	3.1	2.4	2.2	3.1	1.9	--	2.3	3.1	7.0
25 - 29 years.....	22.1	23.5	13.2	13.7	25.2	17.1	13.2	15.6	20.5	19.7	28.6
30 - 34 years.....	22.8	23.9	21.2	21.3	22.6	24.8	17.9	18.9	19.3	25.9	18.5
35 - 39 years.....	16.3	17.3	16.1	15.7	14.3	16.3	14.2	14.4	20.5	18.5	10.6
40 - 44 years.....	10.5	10.0	14.9	14.5	10.9	12.4	12.3	14.4	4.5	12.4	6.7
45 - 49 years.....	9.4	8.9	8.8	12.9	10.9	8.5	13.2	21.1	17.0	8.1	7.6
50 - 54 years.....	7.0	6.6	7.8	8.7	6.5	7.8	12.3	2.2	5.7	4.2	8.7
55 - 59 years.....	4.1	3.7	6.3	4.7	4.3	3.8	5.6	7.8	3.4	2.3	4.8
60 - 64 years.....	2.6	1.9	3.2	4.5	2.2	3.1	3.8	4.5	4.5	3.9	4.2
65 years and over...	1.6	.7	5.4	1.6	.9	3.1	5.6	1.1	2.3	1.9	3.3

TABLE A-4a. --Fields of highest competence of geologists, by level of education, 1951

Field of highest competence	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No college degree
	Number				
All fields	[1] 6,527	1,107	1,651	3,576	[2] 193
Petroleum and natural gas	4,063	240	968	2,725	130
Economic geology	523	187	147	177	12
Paleontology	373	169	104	87	13
Stratigraphy	231	89	73	63	6
Petrography	129	75	32	22	--
Mineralogy	102	43	37	16	6
Geomorphology	90	61	23	6	--
Structural geology	88	46	20	22	--
Other geological specialties	258	35	73	144	6
Geology, general	670	162	174	314	20
	Percent				
All fields	100.0	100.0	100.0	100.0	100.0
Petroleum and natural gas	62.2	21.7	58.6	76.2	67.4
Economic geology	8.0	16.9	8.9	5.0	6.2
Paleontology	5.7	15.3	6.3	2.4	6.7
Stratigraphy	3.5	8.0	4.4	1.8	3.1
Petrography	2.0	6.8	1.9	.6	--
Mineralogy	1.6	3.9	2.3	.4	3.1
Geomorphology	1.4	5.5	1.4	.2	--
Structural geology	1.3	4.1	1.2	.6	--
Other geological specialties	4.0	3.2	4.4	4.0	3.1
Geology, general	10.3	14.6	10.6	8.8	10.4

[1] Excludes 35 not reporting level of education.
[2] Includes 12 with no college training.

TABLE A-4b. --Fields of highest competence of graduate students of geology, by level of education, 1951

Field of highest competence	All levels of education	Ph.D.	Master's degree	Bachelor's degree
	Number			
All fields	706	8	208	490
Petroleum and natural gas	102	--	29	7
Paleontology	90	2	31	5
Stratigraphy	55	1	23	3
Petrography	54	1	19	3
Economic geology	43	--	21	2
Structural geology	29	3	13	1
Mineralogy	20	--	8	1
Geomorphology	19	--	13	
Other geological specialties	8	--	1	
Geology, general	286	1	50	23
	Percent			
All fields	100.0	(1)	100.0	100.
Petroleum and natural gas	14.5	--	13.9	14.
Paleontology	12.7	(1)	14.9	11.
Stratigraphy	7.8	(1)	11.1	6.
Petrography	7.7	(1)	9.1	6.
Economic geology	6.1	--	10.1	4.
Structural geology	4.1	(1)	6.3	2.
Mineralogy	2.8	--	3.8	2.
Geomorphology	2.7	--	6.3	1.
Other geological specialties	1.1	--	.5	1.

TABLE A-5a. --Age distribution and median age of geologists, by level of education, 1951

Age group	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No college degree
	Number				
All ages	[1] 6,523	1,107	1,651	3,573	[2] 192
Under 25 years	237	1	30	195	11
25 - 29 years	1,445	36	413	982	14
30 - 34 years	1,492	155	454	867	16
35 - 39 years	1,065	182	304	555	24
40 - 44 years	683	191	159	293	40
45 - 49 years	610	195	113	270	32
50 - 54 years	453	144	82	199	28
55 - 59 years	267	86	46	118	17
60 - 64 years	167	68	31	63	5
65 years and over	104	49	19	31	5
	Percent				
All ages	100.0	100.0	100.0	100.0	100.0
Under 25 years	3.6	.1	1.8	5.5	5.7
25 - 29 years	22.2	3.3	25.0	27.4	7.3
30 - 34 years	22.8	14.0	27.5	24.2	8.3
35 - 39 years	16.3	16.4	18.4	15.5	12.5
40 - 44 years	10.5	17.3	9.6	8.2	20.8
45 - 49 years	9.4	17.6	6.8	7.6	16.7
50 - 54 years	6.9	13.0	5.0	5.6	14.6
55 - 59 years	4.1	7.8	2.8	3.3	8.9
60 - 64 years	2.6	6.1	1.9	1.8	2.6
65 years and over	1.6	4.4	1.2	.9	2.6
Median age	35	45	34	34	44

[1] Excludes 33 geologists not reporting level of education, 4 not reporting age and 2 not reporting age and education.

TABLE A-5b. --Age distribution and median age of graduate students of geology, by level of education

Age group	All levels of education	Ph.D.	Master's degree
	Number		
All ages	[1] 704	8	207
Under 25 years	220	—	32
25 - 29 years	336	5	104
30 - 34 years	124	3	61
35 - 39 years	18	—	9
40 years and over	6	—	1
	Percent		
All ages	100.0	([2])	100.0
Under 25 years	31.2	—	15.5
25 - 29 years	47.7	([2])	50.2
30 - 34 years	17.6	([2])	29.5
35 - 39 years	2.6	—	4.3
40 years and over	.9	—	.5
Median age	27	([2])	28

[1] Excludes 2 not reporting age.
[2] Too few cases to permit computation of percentages and median.

TABLE A-6. --Fields of education of geologists, by level of education, 1951

Major subject for highest degree	All levels of education	Ph.D.	Master's degree	Bachelor's degree
	Number			
Total reporting	[1] 6,491	1,104	1,643	3,567
	Percent			
Total	100.0	100.0	100.0	100.0
Physical sciences	88.0	95.6	93.2	83.9
Geology	86.5	93.7	92.0	82.4
Chemistry	.6	.5	.3	.7
Physics, geophysics, and crystallography	.5	1.0	.3	.4
Other physical sciences	.4	.4	.6	.4
Engineering	10.1	1.0	5.2	14.5
Petroleum and geological	6.2	.6	2.9	9.3
Mining and metallurgical	2.3	.1	1.6	3.3
Civil	.4	—	.1	.6
Other engineering	1.2	.3	.6	1.3
Biological sciences	.6	2.3	.5	.2
Social sciences and related fields	.8	1.0	.9	.7
Other fields	.5	.1	.2	.7

[1] Excludes 36 not reporting major subject for highest degree, 5 not reporting level of education, and 30 not major subject and level of education.

TABLE A-7. --Fields of current employment of geologists, by field of highest competence, 1951

Field of current employment	Field of highest competence										
	All fields	Petroleum and natural gas	Economic geology	Paleontology	Stratigraphy	Petrography	Mineralogy	Geomorphology	Structural geology	Other geological specialties	Geology, general
	Number										
Total reporting	[1] 6,558	4,085	523	380	231	129	106	90	87	259	668
	Percent										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Geology	92.7	95.1	93.5	94.7	93.1	90.7	89.6	86.6	95.4	93.8	76.4
Petroleum and natural gas	59.8	91.9	2.3	3.9	8.7	3.9	3.8	--	15.0	5.0	13.2
Economic geology	7.2	.4	78.2	.3	2.6	2.3	2.8	--	6.9	3.5	2.7
Paleontology	4.9	.1	.2	78.9	1.3	.8	--	--	1.1	--	1.0
Stratigraphy	2.8	.5	.6	4.2	59.4	1.5	--	--	1.1	.4	.6
Petrography	1.4	.1	.7	--	.4	56.6	1.9	--	2.3	1.1	.2
Mineralogy	1.4	[2]	.7	--	.4	3.9	72.6	--	--	.4	--
Geomorphology	.9	--	--	--	--	--	--	64.4	1.2	.8	.2
Structural geology	.8	.2	.4	.3	.4	--	--	--	41.4	--	--
Other geological specialties	3.7	.4	1.0	--	1.3	--	.9	4.4	1.1	79.1	1.0
Geology, general	9.8	1.5	9.4	7.1	18.6	21.7	7.6	17.8	25.3	3.5	57.5
Geophysics	1.7	.9	1.3	.3	3.5	3.9	1.9	2.2	2.3	1.2	6.4
Meteorology	[2]	.1	--	--	--	--	--	--	--	--	--
Engineering	.7	.8	.8	--	--	--	--	--	--	1.5	.5
Other scientific fields	.6	.1	.8	3.4	.4	3.9	1.9	5.6	--	--	1.0
Nonscientific fields	4.3	3.0	3.6	1.6	3.0	1.5	6.6	5.6	2.3	3.5	15.7

[1] Excludes 4 unemployed.
[2] Less than 0.05 percent.

TABLE A-8. --Industries in which geologists were employed, by field of highest competence, 1951

Industry	All fields	Petroleum and natural gas	Economic geology	Paleontology	Stratigraphy	Petrography	Mineralogy	Geomorphology	Structural geology	Other geological specialties
	Number									
All industries	[1] 6,191	3,884	489	360	215	117	95	78	83	
Crude petroleum and natural gas	4,076	3,523	24	129	83	11	7	--	24	
Mining	194	7	149	--	1	2	4	--	4	
Manufacturing	133	79	25	2	3	7	6	--	3	
Business and research services	88	39	12	6	1	3	1	3	--	
Colleges and universities	802	75	82	138	73	69	45	54	35	
Government	790	117	195	53	53	24	28	20	17	
Other industries	108	44	2	32	1	1	4	1	--	
	Percent									
All industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	10
Crude petroleum and natural gas	65.8	90.7	4.9	35.8	38.6	9.4	7.4	--	28.9	2
Mining	3.1	.2	30.5	--	.5	1.7	4.2	--	4.8	
Manufacturing	2.2	2.1	5.1	.6	1.4	6.0	6.3	--	3.6	
Business and research services	1.4	1.0	2.4	1.7	.5	2.6	1.0	3.9	--	
Colleges and universities	13.0	1.9	16.8	38.3	33.9	59.0	47.4	69.2	42.2	
Government	12.8	3.0	39.9	14.7	24.6	20.5	29.5	25.6	20.5	5
Other industries	1.7	1.1	.4	8.9	.5	.8	4.2	1.3	--	

[1] Excludes 3 not reporting industry.

TABLE A-9. --Industries in which geologists were employed, by level of education, 1951

Industry	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No colle degree
	Number				
l industries	[1] 6,162	1,068	1,590	3,321	[2]
uds petroleum and natural gas	4,057	220	1,007	2,689	
ning	193	47	47	91	
nufacturing	133	22	31	79	
siness and research services	88	20	17	46	
lleges and universities	798	550	180	65	
vernment	788	194	279	300	
ner industries	105	15	29	51	
	Percent				
l industries	100.0	100.0	100.0	100.0	1
ude petroleum and natural gas	65.8	20.6	63.3	81.0	
ning	3.1	4.4	3.0	2.7	
nufacturing	2.2	2.0	2.0	2.4	
siness and research services	1.4	1.9	1.1	1.4	
lleges and universities	13.0	51.5	11.3	2.0	
vernment	12.8	18.2	17.5	9.0	
ner industries	1.7	1.4	1.8	1.5	

[1] Excludes 3 not reporting industry and 29 not reporting level of education.
[2] Includes 10 with no college training.

TABLE A-10. --Age distribution and median age of geologists, by type of employer, 1951

Age group	All employers	Private industry	Colleges and universities	Federal Government	State and local government	Other employer
	Number					
l ages	[1] 6,185	4,550	801	617	173	
der 25 years	181	141	8	24	7	
- 29 years	1,327	1,080	81	119	43	
- 34 years	1,436	1,082	149	151	48	
- 39 years	1,052	776	138	106	26	
- 44 years	669	466	113	74	10	
- 49 years	571	395	101	55	8	
- 54 years	443	306	92	31	11	
- 59 years	251	170	48	26	6	
- 64 years	153	79	44	17	10	
years and over	102	55	27	14	4	
	Percent					
l ages	100.0	100.0	100.0	100.0	100.0	1(
der 25 years	2.9	3.1	1.0	3.9	4.0	
- 29 years	21.5	23.7	10.1	19.3	24.9	
- 34 years	23.2	23.8	18.6	24.5	27.7	1
- 39 years	17.0	17.1	17.2	17.2	15.0	1
- 44 years	10.8	10.3	14.1	12.0	5.8	
- 49 years	9.2	8.7	12.6	8.9	4.6	2
- 54 years	7.2	6.7	11.5	5.0	6.4	
- 59 years	4.1	3.7	6.0	4.2	3.5	
- 64 years	2.5	1.7	5.5	2.7	5.8	
years and over	1.6	1.2	3.4	2.3	2.3	
dian age	36	35	41	36	34	

[1] Excludes 6 not reporting age and 3 not reporting type of employer.

TABLE A-11. --Industries in which geologists were employed, by function performed, 1951

Industry	All functions	Research and field exploration	Administration	Teaching	Consulting	Production and operation	Technical writing	In
	Number							
All industries	[1] 6,162	3,552	890	720	617	214	66	
Crude petroleum and natural gas	4,063	2,656	696	1	480	166	9	
Mining	193	116	31	--	35	8	--	
Manufacturing	129	85	22	--	8	7	3	
Business and research services	88	23	4	1	53	4	1	
Colleges and universities	801	62	19	715	--	2	2	
Government	779	557	95	--	28	18	48	
Other industries	109	53	23	3	13	9	3	
	Percent							
All industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Crude petroleum and natural gas	66.0	74.8	78.2	.1	77.8	77.6	13.6	
Mining	3.1	3.3	3.5	--	5.7	3.7	--	
Manufacturing	2.1	2.4	2.5	--	1.3	3.3	4.6	
Business and research services	1.4	.6	.4	.1	8.6	1.9	1.5	
Colleges and universities	13.0	1.7	2.1	99.3	--	.9	3.0	
Government	12.6	15.7	10.7	--	4.5	8.4	72.7	
Other industries	1.8	1.5	2.6	.5	2.1	4.2	4.6	

[1] Excludes 3 not reporting industry and 29 not reporting function.

TABLE A-12.--Functions performed by geologists, by level of education, 1951

Function	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No college degree
	Number				
All functions	[1] 6,137	1,062	1,581	3,311	[2] 183
Research and field exploration	3,536	341	989	2,123	83
Administration	887	133	207	499	48
Teaching	718	502	159	55	2
Consulting	615	70	139	376	30
Production and operation	212	6	38	155	13
Technical writing	66	8	21	35	2
Inspection	62	1	14	43	4
Other functions	41	1	14	25	1
	Percent				
All functions	100.0	100.0	100.0	100.0	100.0
Research and field exploration	57.6	32.1	62.5	64.1	45.4
Administration	14.5	12.5	13.1	15.1	26.2
Teaching	11.7	47.3	10.1	1.7	1.1
Consulting	10.0	6.6	8.8	11.3	16.4
Production and operation	3.5	.6	2.4	4.7	7.1
Technical writing	1.1	.7	1.3	1.1	1.1
Inspection	1.0	.1	.9	1.3	2.2
Other functions	.6	.1	.9	.7	.5

[1] Excludes 28 not reporting function, 28 not reporting level of education, and 1 not reporting function and level of education.

[2] Includes 10 with no college training.

TABLE A-13.--Age distribution and median age of geologists, by function performed, 1951

Age group	All functions	Research and field exploration	Administration	Teaching	Consulting	Production and operation	Technical writing	Inspection	Other functions
	Number								
ages	[1] 6,160	3,549	890	719	619	214	66	62	41
- 25 years	182	133	2	5	7	17	8	7	3
29 years	1,323	1,055	20	71	48	60	29	21	19
34 years	1,426	1,036	86	134	101	41	9	14	5
39 years	1,051	560	188	129	114	34	8	12	6
44 years	671	286	170	107	79	19	4	2	4
49 years	568	197	186	84	81	15	3	—	2
54 years	438	128	133	77	77	16	—	5	2
59 years	249	88	67	44	44	3	3	—	—
64 years	152	39	33	42	30	5	2	1	—
ears and over	100	27	5	26	38	4	—	—	—
	Percent								
ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
r 25 years	3.0	3.7	.2	.7	1.1	7.9	12.1	11.3	7.3
29 years	21.5	29.7	2.3	9.9	7.8	28.0	43.9	33.9	46.3
34 years	23.1	29.2	9.7	18.6	16.3	19.2	13.6	22.6	12.2
39 years	17.1	15.8	21.1	18.0	18.4	15.9	12.1	19.3	14.6
44 years	10.9	8.1	19.1	14.9	12.8	8.9	6.1	3.2	9.8
49 years	9.2	5.5	20.9	11.7	13.1	7.0	4.6	--	4.9
54 years	7.1	3.6	14.9	10.7	12.4	7.5	—	8.1	4.9
59 years	4.0	2.5	7.5	6.1	7.1	1.4	4.6	—	—
64 years	2.5	1.1	3.7	5.8	4.9	2.3	3.0	1.6	—

TABLE A-14.--Annual professional income of geologists, by age, 1951

Annual income	All ages	Under 25 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65 years and over
	Number										
Total	[1] 4,847	139	1,063	1,154	820	527	432	332	202	116	62
Under $3,000	87	15	24	14	11	3	6	3	3	5	3
$3,000 - $3,999	387	47	210	85	21	9	3	6	2	--	4
$4,000 - $4,999	1,025	62	504	311	86	25	17	5	8	4	3
$5,000 - $5,999	818	9	223	328	123	58	25	26	10	11	5
$6,000 - $6,999	541	4	52	169	118	76	51	28	22	15	6
$7,000 - $7,999	464	1	24	113	103	73	55	43	26	18	8
$8,000 - $9,999	547	--	13	61	153	109	84	64	34	18	11
$10,000 - $14,999	543	1	9	42	136	112	109	69	36	18	11
$15,000 and over	435	--	4	31	69	62	82	88	61	27	11
	Percent										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under $3,000	1.8	10.8	2.3	1.2	1.3	.6	1.4	.9	1.5	4.3	4.8
$3,000 - $3,999	8.0	33.8	19.7	7.4	2.6	1.7	.7	1.8	1.0	--	6.5
$4,000 - $4,999	21.1	44.6	47.4	27.0	10.5	4.7	3.9	1.5	4.0	3.5	4.8
$5,000 - $5,999	16.9	6.5	21.0	28.4	15.0	11.0	5.8	7.8	5.0	9.5	8.1
$6,000 - $6,999	11.1	2.9	4.9	14.6	14.4	14.4	11.8	8.4	10.8	12.9	9.7
$7,000 - $7,999	9.6	.7	2.3	9.8	12.6	13.8	12.7	13.0	12.9	15.5	13.0
$8,000 - $9,999	11.3	--	1.2	5.3	18.6	20.7	19.4	19.3	16.8	15.5	17.7
$10,000 - $14,999	11.2	.7	.8	3.6	16.6	21.3	25.3	20.8	17.8	15.5	17.7
$15,000 and over	9.0	--	.4	2.7	8.4	11.8	19.0	26.5	30.2	23.3	17.7
Median income	$6,200	$4,100	$4,600	$5,500	$7,500	$8,400	$9,400	$9,700	$9,800	$8,600	$8,400
Lower quartile	4,700	3,400	4,100	4,600	5,700	6,500	7,100	7,300	7,200	6,600	6,100
Upper quartile	9,100	4,700	5,300	6,800	10,000	11,900	13,800	([2])	([2])	14,400	13,000

[1] Excludes 1,341 not reporting income, 5 not reporting age, and 1 not reporting income and age.
[2] The upper quartile value is $15,000 or more.

TABLE A-15. --Median and quartile incomes and median age of geologists, by type of employer and level of education, 1951[1]

Item	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No college degree
	All types of employers				
Median income	$6,200	$7,200	$5,500	$6,000	$8,000
Lower quartile	4,700	5,800	4,400	4,600	5,700
Upper quartile	9,100	9,400	8,000	9,300	12,700
Median age	35	44	34	34	44
	Private industry				
Median income	$6,700	$10,500	$6,200	$6,500	$8,900
Lower quartile	4,900	7,400	4,900	4,800	6,200
Upper quartile	10,500	14,900	9,700	9,800	13,600
Median age	35	44	34	34	45
	Colleges and universities				
Median income	$5,900	$6,700	$4,200	$4,000	(2)
Lower quartile	4,500	5,400	3,500	3,300	(2)
Upper quartile	7,600	8,200	5,000	4,900	(2)
Median age	41	44	35	33	(2)
	Government				
Median income	$5,200	$6,700	$4,800	$4,600	(2)
Lower quartile	4,000	5,600	4,000	3,600	(2)
Upper quartile	6,700	8,000	5,900	5,800	(2)
Median age	35	42	33	33	(2)

TABLE A-16.--Annual professional income of geologists, by level of education 1951

Annual income	All levels of education	Ph. D.	Master's degree	Bachelor's degree	No college degree
	Number				
Total	[1] 4,830	875	1,278	2,536	[2] 141
Under $3,000	87	9	29	46	3
$3,000 - $3,999	383	15	142	220	6
$4,000 - $4,999	1,025	88	335	589	13
$5,000 - $5,999	812	142	242	410	18
$6,000 - $6,999	542	161	122	239	20
$7,000 - $7,999	463	134	87	231	11
$8,000 - $9,999	545	149	115	261	20
$10,000 - $14,999	541	113	109	292	27
$15,000 and over	432	64	97	248	23
	Percent				
Total	100.0	100.0	100.0	100.0	100.0
Less than $3,000	1.8	1.0	2.3	1.8	2.1
$3,000 - $3,999	7.9	1.7	11.1	8.7	4.3
$4,000 - $4,999	21.2	10.1	26.2	23.2	9.2
$5,000 - $5,999	16.8	16.3	18.9	16.2	12.8
$6,000 - $6,999	11.2	18.4	9.6	9.4	14.2
$7,000 - $7,999	9.6	15.3	6.8	9.1	7.8
$8,000 - $9,999	11.3	17.0	9.0	10.3	14.2
$10,000 - $14,999	11.2	12.9	8.5	11.5	19.1
$15,000 and over	9.0	7.3	7.6	9.8	16.3
Median income	$6,200	$7,200	$5,500	$6,000	$8,000
Lower quartile	4,700	5,800	4,400	4,600	5,700
Upper quartile	9,100	9,400	8,000	9,300	12,700

[1] Excludes 1,335 not reporting income, 22 not reporting level of education, and 7 not reporting income and level of education.

APPENDIX B

GEOPHYSICS

TABLE B-1a.--Military status of men geophysicists, by age, 1951

Age group	Total	On active duty	In reserve forces	No present military status		
				Total	Veteran	Nonveter
	Number					
ges	[1] 2,821	92	617	2,112	628	1,
25 years	196	22	58	116	76	
20 years	1	--	--	1	1	
21 years	2	--	1	1	--	
22 years	7	1	1	5	--	
23 years	40	10	11	19	3	
24 years	58	7	19	32	24	
25 years	88	4	26	58	48	
34 years	972	33	352	587	331	
26 years	95	4	28	63	46	
27 years	106	3	34	69	55	
28 years	120	4	44	72	53	
29 years	115	4	40	71	49	
30 years	118	5	55	58	38	
31 years	116	4	47	65	29	
32 years	100	2	28	70	28	
33 years	102	4	39	59	23	
34 years	100	3	37	60	10	
39 years	533	8	103	422	50	
44 years	520	10	63	447	37	
49 years	289	7	29	253	21	
54 years	157	10	11	136	48	
59 years	71	2	1	68	44	
64 years	47	--	--	47	14	
ars and over	36	--	--	36	7	
	Percent					
ges	100.0	3.3	21.8	74.9	22.3	5
25 years	100.0	11.2	29.6	59.2	38.8	2
20 years	[2]	--	--	[2]	[2]	
21 years	[2]	--	[2]	[2]	--	[2]
22 years	[2]	[2]	[2]	[2]	--	[2]
23 years	100.0	25.0	27.5	47.5	7.5	4
24 years	100.0	12.1	32.7	55.2	41.4	1
25 years	100.0	4.5	29.6	65.9	54.5	1
34 years	100.0	3.4	36.2	60.4	34.1	2
26 years	100.0	4.2	29.5	66.3	48.4	1
27 years	100.0	2.8	32.1	65.1	51.9	1
28 years	100.0	3.3	36.7	60.0	44.2	1
29 years	100.0	3.5	34.8	61.7	42.6	1
30 years	100.0	4.2	46.6	49.2	32.2	1
31 years	100.0	3.5	40.5	56.0	25.0	3
32 years	100.0	2.0	28.0	70.0	28.0	4
33 years	100.0	3.9	38.2	57.9	22.6	3
34 years	100.0	3.0	37.0	60.0	10.0	5
39 years	100.0	1.5	19.3	79.2	9.4	6
44 years	100.0	1.9	12.1	86.0	7.1	7
49 years	100.0	2.4	10.0	87.6	7.3	8
54 years	100.0	6.4	7.0	86.6	30.6	5
59 years	100.0	2.8	1.4	95.8	62.0	3
64 years	100.0	--	--	100.0	29.8	7
ars and over	100.0	--	--	100.0	19.4	8

Excludes 56 not reporting military status; 15 who listed a military status other than those listed here, such as Fleet ve; 6 not reporting age; and 1 not reporting military status and age.
Too few cases to permit computation of percentages.

TABLE B-1b.--Military status of men graduate students of geophysics, by age, 1951

Age group	Total	On active duty	In reserve forces	No military status		
				Total	Veteran	Nonvet
All ages	[1] 143	3	40	100	68	
20 - 25 years	57	--	13	44	19	
20 years	--	--	--	--	--	
21 years	2	--	--	2	--	
22 years	6	--	2	4	--	
23 years	13	--	--	13	3	
24 years	16	--	8	8	3	
25 years	20	--	3	17	13	
26 - 34 years	81	2	26	53	46	
26 years	22	--	8	14	14	
27 years	18	--	6	12	11	
28 years	13	1	3	9	9	
29 years	6	--	1	5	4	
30 years	8	1	3	4	3	
31 years	5	--	1	4	2	
32 years	6	--	4	2	2	
33 years	2	--	--	2	--	
34 years	1	--	--	1	1	
35 - 39 years	4	1	1	2	2	
40 years and over	1	--	--	1	1	

[1] Excludes 2 not reporting military status.

TABLE B-2.--Detailed fields of highest competence of geophysicists, 1951

Field of highest competence	Number	Percent
All fields	2,936	[1] 100.0
Geophysical exploration	1,555	53.0
Seismic	1,112	37.9
Gravimetric	101	3.4
Magnetic; electric	86	2.9
Airborne geomagnetic	30	1.0
Radiometric	27	.9
Other specialties	6	.2
Geophysical exploration, general	193	6.6
Hydrology	694	23.6
Ground-water hydrology	211	7.2
Engineering hydrology	134	4.6
Stream gaging	75	2.6
Irrigation drainage	45	1.5
Agricultural hydrology	36	1.2
Forecasting; snow surveying	29	1.0
Hydrometeorology	25	.9
Sedimentation	25	.9
Snow, ice, and permafrost studies	18	.6
Evapotransportation	12	.4
Quality of natural waters; lakes	3	.1
Other specialties	4	.1
Hydrology, general	77	2.6
Oceanography	156	5.3
Physical properties, sea water	21	.7
Dynamic oceanography; tides, currents	19	.6
Beach and near-shore processes	17	.6
Waves	13	.4
Ocean-bottom sediments, structure	12	.4
Atmosphere-sea relations; sea ice	9	.3
Hydrography	9	.3
Oceanographic chemistry	8	.3
Other specialties	2	.1
Oceanography, general	46	1.6
Seismology	140	4.8
Microseisms and correlations	38	1.3
Engineering aspects	17	.6
Station operation; epicenter location	12	.4
Wave mechanics; earth structure	10	.3
Seismicity; economic aspects	5	.2
Other specialties	5	.2
Seismology, general	53	1.8
Geodesy	115	3.9
Triangulation; traverse; geodetic leveling	40	1.4
Cartography, topography, photogrammetry	38	1.3
Electronic methods	3	.1
Geodetic astronomy; latitude variation	2	.1
Map projection mathematics; figure of earth	1	[2]
Other specialties	1	[2]
Geodesy, general	30	1.0
Volcanology, geochemistry and petrology	89	3.0
Geochemical prospecting	16	.5
Radioactivity; distribution of elements	15	.5
Rocks, minerals	12	.4
Experimental petrology	8	.3
Volcanic processes; geothermal gradients	2	.1
Intrusion mechanics; ore-farming fluids	1	[2]
Other specialties	2	.1
Volcanology, geochemistry and petrology, general	33	1.1
Terrestrial magnetism and electricity	66	2.2
Geomagnetism	24	.8
Ionosphere	16	.5
Atmospheric electricity	6	.2
Solar and cosmic effects	4	.1
Geoelectricity	3	.1
Other specialties	1	[2]
Terrestrial magnetism and electricity, general	12	.4
Tectonophysics	17	.6
Earth's crust	6	.2
Structural petrology	4	.1
Rock, mineral deformation	2	.1
Physical properties, rocks and minerals	1	[2]
Tectonophysics, general	4	.1
Geophysics, general	104	3.5

[1] Totals may not add because of rounding.
[2] Less than 0.05 percent.

TABLE B-3. --Age distribution and median age of geophysicists, by field of highest competence, 1951

Age group	All fields	Geophysical exploration	Hydrology	Oceanography	Seismology	Geodesy	Volcanology, geochemistry, and petrology	Terrestrial magnetism and electricity	Tectono-physics	General Geophysics
	Number									
All ages	[1] 2,929	1,552	691	156	140	115	89	66	17	103
Under 25 years	111	78	7	6	8	3	3	4	--	2
25 - 29 years	539	350	89	31	25	8	11	9	1	15
30 - 34 years	549	284	123	48	21	17	24	15	3	14
35 - 39 years	544	313	115	32	20	16	18	10	4	16
40 - 44 years	543	299	140	15	20	18	14	10	2	25
45 - 49 years	309	135	89	13	14	23	6	11	4	14
50 - 54 years	164	66	49	4	15	15	4	3	1	7
55 - 59 years	77	18	30	2	7	9	4	--	1	6
60 - 64 years	53	4	26	3	7	5	3	2	1	2
65 years and over	40	5	23	2	3	1	2	2	--	2
	Percent									
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	[2]	100.0
Under 25 years	3.8	5.0	1.0	3.8	5.7	2.6	3.4	6.1	--	1.9
25 - 29 years	18.4	22.5	12.9	19.9	17.9	7.0	12.4	13.6	[2]	14.6
30 - 34 years	18.7	18.3	17.8	30.8	15.0	14.8	27.0	22.7	[2]	13.6
35 - 39 years	18.6	20.1	16.6	20.5	14.3	13.9	20.2	15.2	[2]	15.6
40 - 44 years	18.6	19.3	20.3	9.6	14.3	15.7	15.7	15.2	[2]	24.3
45 - 49 years	10.5	8.7	12.9	8.3	10.0	20.0	6.7	16.7	[2]	13.6
50 - 54 years	5.6	4.3	7.1	2.6	10.7	13.0	4.5	4.5	[2]	6.8
55 - 59 years	2.6	1.2	4.3	1.3	5.0	7.8	4.5	--	[2]	5.8
60 - 64 years	1.8	.3	3.8	1.9	5.0	4.3	3.4	3.0	[2]	1.9
65 years and over	1.4	.3	3.3	1.3	2.1	.9	2.2	3.0	--	1.9
Median age	37	36	40	34	39	44	37	38	[2]	41

[1] Excludes 7 geophysicists not reporting age.
[2] Too few cases to permit computation of percentages and median.

TABLE B-4.--Fields of highest competence of geophysicists, by level of education, 1951

Field of highest competence	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No college degree
	Number				
All fields	[1] 2,896	336	538	1,705	[2] 317
Geophysical exploration	1,532	88	218	1,013	213
Hydrology	690	57	160	428	45
Oceanography	151	30	62	49	10
Seismology	137	36	22	67	12
Geodesy	112	6	23	66	17
Volcanology, geochemistry and petrology	89	56	18	13	2
Terrestrial magnetism and electricity	65	16	15	27	7
Tectonophysics	17	13	4	—	—
Geophysics, general	103	34	16	42	11
	Percent				
All fields	100.0	100.0	100.0	100.0	100.0
Geophysical exploration	52.9	26.2	40.5	59.4	67.2
Hydrology	23.8	17.0	29.7	25.1	14.2
Oceanography	5.2	8.9	11.5	2.9	3.1
Seismology	4.7	10.7	4.1	3.9	3.8
Geodesy	3.9	1.8	4.3	3.9	5.4
Volcanology, geochemistry and petrology	3.1	16.7	3.4	.7	.6
Terrestrial magnetism and electricity	2.2	4.7	2.8	1.6	2.2
Tectonophysics	.6	3.9	.7	—	—
Geophysics, general	3.6	10.1	3.0	2.5	3.5

[1] Excludes 40 not reporting level of education.
[2] Includes 50 with no college training.

TABLE B-5.--Age distribution and median age of geophysicists, by level of education, 1951

Age group	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No college degree
	Number				
All ages	[1] 2,893	335	538	1,704	[2] 316
Under 25 years	110	--	10	96	4
25 - 29 years	534	21	89	388	36
30 - 34 years	542	41	118	330	53
35 - 39 years	534	58	116	289	71
40 - 44 years	536	65	102	288	81
45 - 49 years	306	57	57	155	37
50 - 54 years	163	41	25	81	16
55 - 59 years	77	22	13	33	9
60 - 64 years	52	20	4	23	5
65 years and over	39	10	4	21	4
	Percent				
All ages	100.0	100.0	100.0	100.0	100.0
Under 25 years	3.8	--	1.9	5.6	1.3
25 - 29 years	18.5	6.3	16.6	22.8	11.4
30 - 34 years	18.7	12.2	21.9	19.4	16.8
35 - 39 years	18.5	17.3	21.6	17.0	22.5
40 - 44 years	18.5	19.4	19.0	16.9	25.6
45 - 49 years	10.6	17.0	10.6	9.1	11.7
50 - 54 years	5.6	12.2	4.6	4.8	5.0
55 - 59 years	2.7	6.6	2.4	1.9	2.8
60 - 64 years	1.8	6.0	.7	1.3	1.6
65 years and over	1.3	3.0	.7	1.2	1.3
Median age	37	44	37	36	40

TABLE B-6.--Fields of education of geophysicists, by level of education, 1951

Major subject for highest degree	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No college degree
	Number				
Total reporting	[1] 2,797	331	528	1,684	2
	Percent				
Total	100.0	100.0	100.0	100.0	100
Physical sciences	57.4	86.4	71.0	50.6	36
Geology	28.0	34.1	33.7	27.3	13
Physics, geophysics, and crystallography	19.1	38.7	27.3	14.5	7
Mathematics	4.9	1.8	4.7	4.6	11
Chemistry	2.7	5.8	1.5	2.4	3
Meteorology	1.3	.9	3.2	.8	
Other physical sciences	1.4	5.1	.6	1.0	
Engineering	36.8	10.6	22.2	44.7	49
Civil	15.0	4.0	12.3	18.4	13
Electrical and radio	7.8	2.4	3.8	9.8	9
Petroleum and geological	5.2	1.2	1.5	7.2	4
Mechanical and ordnance	1.8	--	.8	2.1	3
Mining and metallurgical	1.7	.3	.2	2.1	3
Chemical and ceramic	1.0	--	.4	1.3	1
Other engineering	4.3	2.7	3.2	3.8	12
Agricultural sciences	1.2	1.8	2.1	.8	
Social sciences and related fields	2.4	--	2.6	2.1	6
Other fields	2.2	1.2	2.1	1.8	6

[1] Excludes 99 not reporting major subject for highest degree, 2 not reporting level of education, and 38 not reporting major subject and level of education.

TABLE B-7.--Fields of current employment of geophysicists, by field of highest competence, 1951

Field of current employment	Field of highest competence									
	All fields	Geophysical exploration	Hydrology	Oceanography	Seismology	Geodesy	Volcanology, geochemistry, and petrology	Terrestrial magnetism and electricity	Tectonophysics	Geophy gene
	Number									
Total reporting	2,936	1,555	694	156	140	115	89	66	17	
	Percent									
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	(1)	
Geophysics	85.5	90.6	80.1	87.8	86.4	75.6	67.4	69.7	(1)	
Geophysical exploration	48.9	89.0	.1	—	20.7	--	1.1	1.5	--	
Hydrology	18.8	.1	79.1	--	—	1.7	--	—	--	
Oceanography	4.9	.1	.3	84.6	—	6.1	--	—	--	
Seismology	2.9	.2	--	--	56.4	--	—	1.5	--	
Geodesy	3.0	.2	.1	2.6	--	66.9	--	--	--	
Volcanology, geochemistry, and petrology	2.0	.1	--	--	—	—	65.2	--	--	
Terrestrial magnetism and electricity	1.5	--	—	—	.7	—	--	63.7	(1)	
Tectonophysics	.4	.1	—	--	--	—	--	--	(1)	
Geophysics, general	3.1	.8	.5	.6	8.6	.9	1.1	3.0	--	
Geology	3.6	3.0	2.3	2.0	2.1	3.5	26.9	4.6	(1)	
Meteorology	.4	—	1.6	.6	--	--	—	1.5	--	
Engineering	4.1	1.2	11.7	.6	3.6	7.8	1.1	3.0	--	
Other scientific fields	2.5	1.1	2.0	5.8	4.3	6.1	2.3	19.7	--	
Nonscientific fields	3.9	4.1	2.3	3.2	3.6	7.0	2.3	1.5	--	

[1] Too few cases to permit computation of percentages.

TABLE B-8.--Industries in which geophysicists were employed, by field of highest competence, 1951

Industry	All fields	Geophysical exploration	Hydrology	Oceanography	Seismology	Geodesy	Volcanology, geochemistry, and petrology	Terrestrial magnetism and electricity	Tectonophysics	Geophysic general
	Number									
All industries	[1] 2,652	1,408	556	137	121	87	60	46	12	8
Crude petroleum and natural gas	1,430	1,261	1	2	57	1	3	1	1	4
Business and research services	112	40	23	21	6	1	5	5	1	
Manufacturing	65	43	2	--	4	--	3	3	--	
Mining	24	21	--	--	--	--	2	--	--	-
Colleges and universities	215	12	37	47	32	17	26	5	8	1
Government	793	28	487	67	22	66	21	32	2	1
Other industries	13	3	6	--	--	2	--	--	--	
	Percent									
All industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	[2]	100.
Crude petroleum and natural gas	53.9	89.6	.2	1.5	47.1	1.1	5.0	2.2	[2]	49.
Business and research services	4.2	2.8	4.1	15.3	5.0	1.1	8.3	10.9	[2]	8.
Manufacturing	2.5	3.1	.4	--	3.3	--	5.0	6.5	--	8.
Mining	.9	1.5	--	--	--	--	3.3	--	--	-
Colleges and universities	8.1	.8	6.6	34.3	26.4	19.6	43.4	10.9	[2]	16.
Government	29.9	2.0	87.6	48.9	18.2	75.9	35.0	69.5	[2]	14.
Other industries	.5	.2	1.1	--	--	2.3	--	--	--	2.

[1] Excludes 1 not reporting industry.
[2] Too few cases to permit computation of percentages.

TABLE B-9.--Industries in which geophysicists were employed, by level of education, 1951

Industry	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No college degree
	Number				
All industries	[1] 2,617	289	499	1,559	[2] 2
Crude petroleum and natural gas	1,408	66	195	953	1
Business and research services	107	24	23	49	
Manufacturing	64	14	12	31	
Mining	24	6	3	13	
Colleges and universities	215	111	69	31	
Government	787	67	192	479	4
Other industries	12	1	5	3	
	Percent				
All industries	100.0	100.0	100.0	100.0	100.
Crude petroleum and natural gas	53.8	22.8	39.1	61.1	71.
Business and research services	4.1	8.3	4.6	3.2	4.
Manufacturing	2.4	4.8	2.4	2.0	2.
Mining	.9	2.1	.6	.8	.
Colleges and universities	8.2	38.4	13.8	2.0	1.
Government	30.1	23.2	38.5	30.7	18.
Other industries	.5	.4	1.0	.2	1.

[1] Excludes 1 not reporting industry and 35 not reporting level of education.
[2] Includes 43 with no college training.

TABLE B-10.--Age distribution and median age of geophysicists, by type of employer, 1951

Age group	All employers	Private industry	Colleges and universities	Federal Government	State and local government	Other employers
	Number					
All ages	[1] 2,647	1,592	215	728	64	4
Under 25 years	95	73	8	12	2	-
25 - 29 years	522	361	38	107	13	
30 - 34 years	507	298	47	146	6	1
35 - 39 years	493	320	26	125	10	1
40 - 44 years	487	306	26	143	10	
45 - 49 years	273	139	20	93	14	
50 - 54 years	135	62	15	48	3	
55 - 59 years	57	15	12	27	2	
60 - 64 years	43	10	14	15	1	
65 years and over	35	8	9	12	3	
	Percent					
All ages	[1] 100.0	100.0	100.0	100.0	100.0	100.
Under 25 years	3.6	4.6	3.7	1.6	3.1	-
25 - 29 years	19.7	22.7	17.7	14.7	20.3	6.
30 - 34 years	19.2	18.7	21.8	20.1	9.4	20.
35 - 39 years	18.6	20.1	12.1	17.2	15.6	25.
40 - 44 years	18.4	19.2	12.1	19.6	15.6	4.
45 - 49 years	10.3	8.7	9.3	12.8	21.9	14.
50 - 54 years	5.1	3.9	7.0	6.6	4.7	14.
55 - 59 years	2.2	1.0	5.6	3.7	3.1	2.
60 - 64 years	1.6	.6	6.5	2.1	1.6	6.
65 years and over	1.3	.5	4.2	1.6	4.7	6.
Median age	37	36	38	39	41	4

[1] Excludes 5 not reporting age and 1 not reporting type of employer.

TABLE B-11.--Industries in which geophysicists were employed, by function performed, 1951

Industry	All functions	Research and field exploration	Administration	Production and operation	Teaching	Consulting	Design	Technical writing	Inspection	Other functions
	Number									
All industries	[1] 2,645	1,491	562	238	124	119	34	30	22	25
Crude petroleum and natural gas	1,428	826	347	149	--	68	4	3	8	23
Business and research services	110	60	20	4	--	23	2	1	--	--
Manufacturing	65	41	17	--	--	--	4	--	3	--
Mining	24	16	3	2	--	3	--	--	--	--
Colleges and universities	214	75	11	4	123	--	--	--	1	--
Government	791	470	158	77	1	24	24	26	10	1
Other industries	13	3	6	2	--	1	--	--	--	1
	Percent									
All industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Crude petroleum and natural gas	54.0	55.4	61.7	62.6	--	57.1	11.8	10.0	36.4	92.0
Business and research services	4.1	4.0	3.6	1.7	--	19.3	5.9	3.3	--	--
Manufacturing	2.5	2.7	3.0	--	--	--	11.8	--	13.6	--
Mining	.9	1.1	.5	.8	--	2.5	--	--	--	--
Colleges and universities	8.1	5.1	2.0	1.7	99.2	--	--	--	4.5	--
Government	29.9	31.5	28.1	32.4	.8	20.2	70.5	86.7	45.5	4.0
Other industries	.5	.2	1.1	.8	--	.9	--	--	--	4.0

[1] Excludes 1 not reporting industry and 7 not reporting function.

TABLE B-12. --Functions performed by geophysicists, by level of education, 1951

Function	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No d de
	Number				
All functions	[1] 2,611	285	496	1,560	
Research and field exploration	1,471	135	308	890	
Administration	556	56	106	321	
Production and operation	233	1	15	178	
Teaching	124	79	35	8	
Consulting	117	5	19	84	
Design	34	3	2	26	
Technical writing	30	1	6	21	
Inspection	21	3	1	15	
Other functions	25	2	4	17	
	Percent				
All functions	100.0	100.0	100.0	100.0	
Research and field exploration	56.3	47.3	62.1	57.0	
Administration	21.3	19.6	21.4	20.6	
Production and operation	8.9	.4	3.0	11.4	
Teaching	4.7	27.7	7.1	.5	
Consulting	4.5	1.7	3.8	5.4	
Design	1.3	1.1	.4	1.7	
Technical writing	1.2	.4	1.2	1.3	
Inspection	.8	1.1	.2	1.0	
Other functions	1.0	.7	.8	1.1	

[1] Excludes 7 not reporting function and 35 not reporting level of education.
[2] Includes 43 with no college training.

TABLE B-13.--Age distribution and median age of geophysicists, by function performed, 1951

Age group	All functions	Research and field exploretion	Adminis-tration	Production and operation	Teaching	Consulting	Design	Technical writing	Inspection	Other functions
	Number									
All ages	[1] 2,641	1,490	561	237	124	118	34	30	22	25
Under 25 years	95	60	1	20	1	4	—	2	1	6
25 - 29 years	522	386	18	72	14	8	—	6	6	12
30 - 34 years	506	339	60	38	29	18	4	10	5	3
35 - 39 years	490	270	117	41	18	25	9	3	6	1
40 - 44 years	428	230	157	39	16	28	12	4	1	1
45 - 49 years	273	111	106	14	16	15	6	3	2	—
50 - 54 years	134	51	58	4	11	5	3	1	—	1
55 - 59 years	57	14	24	6	8	4	—	—	—	1
60 - 64 years	42	16	9	2	8	5	--	1	1	—
65 years and over	34	13	11	1	3	6	—	—	—	—
	Percent									
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 25 years	3.6	4.0	.2	8.4	.8	3.4	—	6.7	4.5	24.0
25 - 29 years	19.8	25.9	3.2	30.4	11.3	6.8	—	20.0	27.3	48.0
30 - 34 years	19.2	22.8	10.7	16.0	23.4	15.3	11.8	33.4	22.8	12.0
35 - 39 years	18.5	18.1	20.8	17.3	14.5	21.2	26.5	10.0	27.3	4.0
40 - 44 years	18.5	15.4	28.0	16.5	12.9	23.7	35.3	13.3	4.5	4.0
45 - 49 years	10.3	7.5	18.9	5.9	12.9	12.7	17.6	10.0	9.1	—
50 - 54 years	5.1	3.4	10.3	1.7	8.8	4.2	8.8	3.3	—	4.0
55 - 59 years	2.1	.9	4.3	2.5	6.5	3.4	--	—	—	4.0
60 - 64 years	1.6	1.1	1.6	.9	6.5	4.2	—	3.3	4.5	—
65 years and over	1.3	.9	2.0	.4	2.4	5.1	—	—	--	—
Median age	37	34	43	33	40	41	42	34	34	28

[1] Excludes 5 not reporting age and 7 not reporting function.

TABLE B-14.--Annual professional income of geophysicists, by age, 1951

Annual income	All ages	Under 25 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	6 a
	Number										
Total	[1] 2,187	76	423	430	401	402	234	116	45	32	
Under $3,000	19	6	6	--	--	--	2	2	1	1	
$3,000 - $3,999	186	25	110	33	13	4	--	--	--	--	
$4,000 - $4,999	349	30	157	88	36	16	13	3	5	1	
$5,000 - $5,999	386	10	85	127	64	57	28	8	2	2	
$6,000 - $6,999	322	3	39	68	81	58	42	15	5	4	
$7,000 - $7,999	267	--	17	43	65	82	28	19	6	6	
$8,000 - $8,999	292	2	9	39	74	73	46	26	8	9	
$10,000 - $14,999	232	--	--	27	49	63	51	18	12	6	
$15,000 and over	134	--	--	5	19	49	24	25	6	3	
	Percent										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Under $3,000	.9	7.9	1.4	--	--	--	.8	1.7	2.2	3.1	
$3,000 - $3,999	8.5	32.9	26.0	7.7	3.2	1.0	--	--	--	--	
$4,000 - $4,999	16.0	39.5	37.1	20.5	9.0	4.0	5.6	2.6	11.1	3.1	
$5,000 - $5,999	17.6	13.2	20.1	29.5	16.0	14.2	12.0	6.9	4.5	6.2	
$6,000 - $6,999	14.7	3.9	9.2	15.8	20.2	14.4	17.9	12.9	11.1	12.5	
$7,000 - $7,999	12.2	--	4.0	10.0	16.2	20.4	12.0	16.4	13.3	18.8	
$8,000 - $9,999	13.4	2.6	2.2	9.1	18.5	18.1	19.7	22.4	17.8	28.1	
$10,000 - $14,999	10.6	--	--	6.3	12.2	15.7	21.8	15.5	26.7	18.8	
$15,000 and over	6.1	--	--	1.1	4.7	12.2	10.2	21.6	13.3	9.4	
Median income	$6,500	$4,200	$4,600	$5,700	$7,100	$7,800	$8,200	$8,800	$8,900	$8,400	
Lower quartile	5,000	3,500	3,900	4,800	5,800	6,400	6,400	7,100	6,700	7,000	
Upper quartile	8,800	4,900	5,500	7,200	9,100	10,900	11,600	13,900	12,800	10,800	

[1] Excludes 461 not reporting income, 4 not reporting age, and 1 not reporting income and age.

	education				
	All types of employers				
Median income	$6,500	$8,100	$6,200	$6,300	$6,900
Lower quartile	5,000	6,100	4,900	4,800	5,400
Upper quartile	8,800	12,400	8,600	8,200	9,000
Median age	37	43	36	36	40
	Private industry				
Median income	$7,300	$12,600	$8,500	$6,800	$7,300
Lower quartile	5,300	8,600	6,300	5,000	5,700
Upper quartile	10,200	[3]	12,000	9,400	9,800
Median age	36	43	38	34	39
	Colleges and universities				
Median income	$5,800	$7,000	$5,300	$4,800	[2]
Lower quartile	4,600	5,400	4,100	3,800	[2]
Upper quartile	8,000	9,500	6,100	5,800	[2]
Median age	36	43	32	32	[2]
	Government				
Median income	$5,800	$7,100	$5,500	$5,800	$5,500
Lower quartile	4,600	5,900	4,400	4,500	4,600
Upper quartile	7,000	9,100	6,700	7,000	6,700
Median age	39	43	36	40	43

[1] Based upon reports from 2,160 geophysicists--excludes 493 not reporting one or more of the following items: Income, age, type of employer, and level of education.
[2] Too few cases to permit computation of medians and quartiles.
[3] The upper quartile value is $15,000 or more.

TABLE B-16. --Annual professional income of geophysicists, by level of education, 1951

Annual income	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No college degree
	Number				
Total	[1] 2,163	226	408	1,296	[2] 233
Less than $3,000	19	3	4	10	2
$3,000 - $3,999	182	2	40	128	12
$4,000 - $4,999	345	15	67	237	26
$5,000 - $5,999	382	34	82	218	48
$6,000 - $6,999	316	30	55	198	33
$7,000 - $7,999	266	28	40	162	36
$8,000 - $9,999	289	33	58	164	34
$10,000 - $14,999	231	51	40	113	27
$15,000 and over	133	30	22	66	15
	Percent				
Total	100.0	100.0	100.0	100.0	100.0
Less than $3,000	.9	1.3	1.0	.8	.9
$3,000 - $3,999	8.4	.9	9.8	9.9	5.1
$4,000 - $4,999	15.9	6.6	16.4	18.3	11.2
$5,000 - $5,999	17.7	15.0	20.1	16.8	20.6
$6,000 - $6,999	14.6	13.3	13.5	15.3	14.2
$7,000 - $7,999	12.3	12.4	9.8	12.5	15.4
$8,000 - $9,999	13.4	14.6	14.2	12.6	14.6
$10,000 - $14,999	10.7	22.6	9.8	8.7	11.6
$15,000 and over	6.1	13.3	5.4	5.1	6.4
Median income	$6,500	$8,100	$6,200	$6,300	$6,900
Lower quartile	5,000	6,100	4,900	4,800	5,400
Upper quartile	8,800	12,400	8,600	8,200	9,000

[1] Excludes 455 not reporting income, 28 not reporting level of education, and 7 not reporting income and level of education.
[2] Includes 36 with no college training.

APPENDIX C

METEROLOGY

Age group	Total	active duty	reserve forces	Total	Veteran	Non-veteran
	Number					
ages	[1] 2,669	444	849	1,376	716	660
25 years	128	22	34	72	61	11
20 years	4	3	--	1	--	1
21 years	4	2	1	1	1	--
22 years	12	6	--	6	4	2
23 years	29	7	9	13	12	1
24 years	46	3	16	27	22	5
25 years	33	1	8	24	22	2
34 years	1,381	300	580	501	405	96
26 years	60	13	19	28	24	4
27 years	89	12	36	41	36	5
28 years	142	37	55	50	45	5
29 years	133	23	66	44	40	4
30 years	174	46	72	56	43	13
31 years	213	50	84	79	66	13
32 years	192	41	87	64	52	12
33 years	210	40	96	74	58	16
34 years	168	38	65	65	41	24
39 years	560	84	181	295	127	168
44 years	326	30	40	256	51	205
49 years	160	5	9	146	22	124
54 years	64	3	4	57	24	33
59 years	27	--	1	26	19	7
64 years	11	--	--	11	4	7
ars and over	12	--	--	12	3	9
	Percent					
ges	100.0	16.7	31.8	51.5	26.8	24.7
25 years	100.0	17.2	26.6	56.2	47.6	8.6
20 years	(2)	(2)	--	(2)	--	(2)
21 years	(2)	(2)	(2)	(2)	(2)	--
22 years	(2)	(2)	--	(2)	(2)	(2)
23 years	100.0	24.2	31.0	44.8	41.4	3.4
24 years	100.0	6.5	34.8	58.7	47.8	10.9
25 years	100.0	3.0	24.3	72.7	66.7	6.0
34 years	100.0	21.7	42.0	36.3	29.3	7.0
26 years	100.0	21.7	31.7	46.6	40.0	6.6
27 years	100.0	13.5	40.4	46.1	40.5	5.6
28 years	100.0	26.1	38.7	35.2	31.7	3.5
29 years	100.0	17.3	49.6	33.1	30.1	3.0
30 years	100.0	26.4	41.4	32.2	24.7	7.5
31 years	100.0	23.5	39.4	37.1	31.0	6.1
32 years	100.0	21.4	45.3	33.3	27.1	6.2
33 years	100.0	19.1	45.7	35.2	27.6	7.6
34 years	100.0	22.6	38.7	38.7	24.4	14.3
39 years	100.0	15.0	32.3	52.7	22.7	30.0
44 years	100.0	9.2	12.3	78.5	15.6	62.9
49 years	100.0	3.1	5.6	91.3	13.8	77.5
54 years	100.0	4.7	6.2	89.1	37.5	51.6
59 years	100.0	--	3.7	96.3	70.4	25.9
64 years	(2)	--	--	(2)	(2)	(2)
ars and over	(2)	--	--	(2)	(2)	(2)

xcludes 33 not reporting military status; 12 who listed a military status other than those listed here, such as Fleet ve; 15 not reporting age; and 1 not reporting military status and age.
oo few cases to permit computation of percentages.

Age group	Total	active duty	reserve forces	Total	Veteran	Nonveteran
All ages	[1] 85	10	43	32	21	11
20 - 25 years	26	2	10	14	7	7
20 years	--	--	--	--	--	--
21 years	1	--	--	1	--	1
22 years	3	--	1	2	--	2
23 years	6	--	3	3	--	3
24 years	7	--	1	6	5	1
25 years	9	2	5	2	2	--
26 - 34 years	51	7	32	12	10	2
26 years	6	2	2	2	2	--
27 years	6	--	5	1	1	--
28 years	9	1	6	2	2	--
29 years	6	--	4	2	2	--
30 years	3	--	2	1	1	--
31 years	8	1	5	2	1	1
32 years	2	1	1	--	--	--
33 years	6	1	4	1	--	1
34 years	5	1	3	1	1	--
35 - 39 years	5	--	1	4	3	1
40 years and over	3	1	--	2	1	1

[1] Excludes 1 who listed a military status other than those listed here, such as Fleet Reserve.

TABLE C-2.--Detailed fields of highest competence of meteorologists, 1951

Field of highest competence	Number	Percent
All fields	2,821	[1] 100.0
Synoptic meteorology	2,020	71.6
Short range forecasting	651	23.1
Observations	538	19.1
Analysis	160	5.7
Objective forecasting	27	1.0
Extended range forecasting	26	.9
Forecast verification	1	([2])
Other specialties	3	.1
Synoptic meteorology, general	614	21.8
Climatology	120	4.3
Experimental and instrumental meteorology	94	3.3
Upper air instruments	22	.8
Surface instruments	15	.5
Experimental techniques	10	.4
Other specialties	4	.1
Experimental and instrumental meteorology, general	43	1.5
Dynamic meteorology	84	3.0
Turbulence; diffusion	20	.7
General circulation	12	.4
Migrating disturbances; local winds	12	.4
Energy exchange	3	.1
Thermodynamics of the atmosphere	1	([2])
Other specialties	2	.1
Dynamic meteorology, general	34	1.2
Physical meteorology	55	1.9
Cloud physics	26	.9
Radiation	12	.4
Acoustics, electricity, and optics	3	.1
Other specialties	6	.2
Physical meteorology, general	8	.3
Upper atmosphere	37	1.3
Micrometeorology	27	1.0
Radio meteorology	15	.5
Cosmical meteorology	2	.1
Meteorology, general	367	13.0

[1] Totals may not add because of rounding.
[2] Less than 0.05 percent.

TABLE C-3.--Age distribution and median age of meteorologists, by field of highest competence, 1951

Age group	All fields	Synoptic meteorology	Climatology	Experimental and instrumental meteorology	Dynamic meteorology	Physical meteorology	Upper atmosphere	Micrometeorology	Cosmical and radio meteorology
	Number								
All ages	[1] 2,604	2,009	118	92	84	54	37	27	17
Under 25 years	97	70	1	2	1	3	--	1	2
25 - 29 years	491	364	7	15	20	7	5	9	8
30 - 34 years	988	739	19	29	37	21	18	10	4
35 - 39 years	577	430	22	22	16	9	5	5	1
40 - 44 years	343	234	26	14	7	8	5	1	2
45 - 49 years	180	112	16	6	2	4	3	1	--
50 - 54 years	70	34	16	--	1	--	--	--	--
55 - 59 years	33	15	5	3	--	1	--	--	--
60 - 64 years	13	6	3	1	--	--	--	--	--
65 years and over	12	5	3	--	--	1	1	--	--
	Percent								
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	([2])
Under 25 years	3.5	3.5	.8	2.2	1.2	5.6	--	3.7	([2])
25 - 29 years	17.5	18.1	5.9	16.3	23.8	13.0	13.5	33.3	([2])
30 - 34 years	35.2	36.8	16.1	31.5	44.1	38.9	48.7	37.1	([2])
35 - 39 years	20.6	21.4	18.7	23.9	19.0	16.7	13.5	18.5	([2])
40 - 44 years	12.2	11.7	22.1	15.2	8.3	14.8	13.5	3.7	([2])
45 - 49 years	6.4	5.6	13.6	6.5	2.4	7.4	8.1	3.7	--
50 - 54 years	2.5	1.7	13.6	--	1.2	--	--	--	--
55 - 59 years	1.2	.7	4.2	3.3	--	1.8	--	--	--
60 - 64 years	.5	.3	2.5	1.1	--	--	--	--	--
65 years and over	.4	.2	2.5	--	--	1.8	2.7	--	--
Median age	34	34	42	35	33	34	34	32	([2])

[1] Excludes 17 meteorologists not reporting age.
[2] Too few cases to permit computation of percentage and median.

Table C-4.--Fields of highest competence of meteorologists, by level of education, 1951

Field of highest competence	All levels of education	Ph.D.	Master's degree	Bachelor's degree	Other degrees	co de
	Number					
All fields	[1] 2,639	117	458	1,238	2	
Synoptic meteorology	1,891	19	259	939	1	
Climatology	112	15	30	39	1	
Experimental and instrumental meteorology	87	8	25	39	--	
Dynamic meteorology	82	35	27	16	--	
Physical meteorology	52	17	19	14	--	
Upper atmosphere	36	9	12	11	--	
Micrometeorology	27	1	10	14	--	
Cosmical and radio meteorology	16	2	5	9	--	
Meteorology, general	336	11	71	157	--	
	Percent					
All fields	100.0	100.0	100.0	100.0	([3])	
Synoptic meteorology	71.7	16.3	56.6	75.8	([3])	
Climatology	4.2	12.8	6.5	3.2	([3])	
Experimental and instrumental meteorology	3.3	6.8	5.5	3.2	--	
Dynamic meteorology	3.1	29.9	5.9	1.3	--	
Physical meteorology	2.0	14.5	4.1	1.1	--	
Upper atmosphere	1.4	7.7	2.6	.9	--	
Micrometeorology	1.0	.9	2.2	1.1	--	
Cosmical and radio meteorology	.6	1.7	1.1	.7	--	
Meteorology, general	12.7	9.4	15.5	12.7	--	

[1] Excludes 182 not reporting level of education.
[2] Includes 173 with no college training.
[3] Too few cases to permit computation of percentages.

Age group	All levels of education	Ph.D.	Master's degree	Bachelor's degree	Other degrees	No col degr
	Number					
All ages	[1] 2,634	117	458	1,237	2	
Under 25 years	80	--	4	21	--	
25 - 29 years	463	9	72	203	1	
30 - 34 years	935	40	167	505	1	
35 - 39 years	553	27	123	277	--	
40 - 44 years	320	19	48	136	--	
45 - 49 years	171	11	32	64	--	
50 - 54 years	61	5	7	17	--	
55 - 59 years	29	3	2	7	--	
60 - 64 years	11	2	2	3	--	
65 years and over	11	1	1	4	--	
	Percent					
All ages	100.0	100.0	100.0	100.0	([3])	
Under 25 years	3.0	--	.9	1.7	--	
25 - 29 years	17.6	7.7	15.7	16.4	([3])	
30 - 34 years	35.5	34.2	36.5	40.8	([3])	
35 - 39 years	21.0	23.1	26.9	22.4	--	
40 - 44 years	12.2	16.2	10.5	11.0	--	
45 - 49 years	6.5	9.4	7.0	5.2	--	
50 - 54 years	2.3	4.3	1.5	1.4	--	
55 - 59 years	1.1	2.6	.4	.6	--	
60 - 64 years	.4	1.7	.4	.2	--	
65 years and over	.4	.8	.2	.3	--	
Median age	34	37	35	34	([3])	

[1] Excludes 170 not reporting level of education, 5 not reporting age, and 12 not reporting age and education.
[2] Includes 171 with no college training.
[3] Too few cases to permit computation of percentages and median.

Major subject for highest degree	All levels of education	Ph.D.	Master's degree	Bachelor's degree	Other degrees	No college degree
	Number					
Total reporting	[1] 2,399	115	457	1,226	2	[2] 599
	Percent					
Total	100.0	100.0	100.0	100.0	([3])	100.0
Physical sciences	66.4	86.1	76.6	63.9	—	60.1
Meteorology	30.4	61.8	59.1	19.6	--	24.5
Mathematics	15.6	2.6	4.1	20.2	--	17.5
Physics, geophysics and crystallography	10.4	15.7	9.4	10.5	--	9.9
Chemistry	7.4	1.7	2.6	10.3	--	6.2
Geology	1.4	1.7	.7	1.9	--	1.2
Other physical sciences	1.2	2.6	.7	1.4	--	.8
Engineering	11.0	4.4	2.0	10.9	--	19.2
Mechanical and ordnance	2.1	--	--	2.9	--	2.7
Electrical and radio	1.5	.9	.7	1.1	--	2.8
Chemical and ceramic	1.3	.9	.4	2.0	--	.5
Aeronautical	1.0	1.7	.2	1.2	--	1.2
Other engineering	5.1	.9	.7	3.7	--	12.0
Agricultural sciences	1.4	--	.4	1.9	--	1.5
Biological sciences	1.1	--	.9	1.5	--	.7
Social sciences and related fields	13.9	6.9	17.9	15.3	--	9.5
Education	5.4	.9	12.3	5.1	—	1.7
Business administration	2.0	--	1.5	2.4	--	1.8
Economics	1.2	--	.2	1.8	--	1.0
History	1.0	--	.2	1.6	--	.7
Other	4.3	6.0	3.7	4.4	--	4.3
Other fields	6.2	2.6	2.2	6.5	([3])	9.0

[1] Excludes 240 not reporting major subject for highest degree, 4 not reporting level of education, and 178 not reporting major subject and level of education.
[2] Includes 2 with no college training.
[3] Too few cases to permit computation of percentage.

Table C-7.--Fields of current employment of meteorologists, by field of highest competence, 1951

Field of current employment	Field of highest competence									
	All fields	Synoptic meteorolcgy	Climatology	Experimental and instrumental meteorology	Dynamic meteorology	Physical meteorology	Upper atmosphere	Micrometeorology	Cosmical and radio meteorology	Met &
	Number									
Total reporting	[1] 2,813	2,013	120	94	84	55	37	27	17	
	Percent									
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	(2)	
Meteorology	82.5	82.8	91.6	85.1	92.8	81.8	78.4	81.5	(2)	
Synoptic meteorology	59.4	76.3	8.3	8.5	9.5	9.1	10.8	3.7	--	
Climatology	4.0	.6	78.3	--	4.8	--	--	--	--	
Experimental and instrumental meteorology	2.6	.4	--	59.6	--	1.8	2.7	3.7	(2)	
Dynamic meteorology	1.9	.1	--	--	59.5	1.8	--	--	--	
Physical meteorology	1.6	.4	--	2.1	--	56.4	--	3.7	--	
Upper atmosphere	.8	.1	--	--	--	--	56.8	--	--	
Micrometeorology	.9	.3	--	--	1.2	1.8	--	66.7	--	
Cosmical and radio meteorology	.5	.1	--	--	--	--	--	--	(2)	
Meteorology, general	10.8	4.5	5.0	14.9	17.8	10.9	8.1	3.7	(2)	
Geophysics	1.1	.9	--	2.1	3.6	1.8	2.7	--	(2)	
Geology	.4	.4	1.7	--	--	--	--	--	--	
Engineering	.9	.8	--	5.3	--	--	--	--	--	
Other scientific fields	3.1	2.5	2.5	1.1	1.2	9.1	18.9	11.1	--	
Nonscientific fields	12.0	12.6	4.2	6.4	2.4	7.3	--	7.4	(2)	

[1] Excludes 8 unemployed.
[2] Too few cases to permit computation of percentages.

TABLE C-8.--Industries in which meteorologists were employed, by field of highest competence, 1951

Industry	All fields	Synoptic meteorology	Climatology	Experimental and instrumental meteorology	Dynamic meteorology	Physical meteorology	Upper atmosphere	Micrometeorology	Cosmical and radio meteorology	Meteorology, general	Other earth sciences
	Number										
All industries	[1] 2,334	1,665	110	80	78	45	29	22	15	275	15
Government	1,904	1,416	91	51	38	18	19	13	10	235	13
Colleges and universities	150	38	16	13	34	19	5	3	3	18	1
Transportation by air	167	158	—	—	1	—	1	—	—	7	—
Business and research services	54	33	1	4	1	6	2	1	—	6	—
Manufacturing	44	13	1	9	4	2	2	5	2	5	1
Other industries	15	7	1	3	—	—	—	—	—	4	—
	Percent										
All industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	(2)	100.0	(2)
Government	81.6	85.0	82.7	63.8	48.7	40.0	65.5	59.1	(2)	85.5	(2)
Colleges and univeraities	6.4	2.3	14.6	16.2	43.6	42.2	17.2	13.6	(2)	6.5	(2)
Transportation by air	7.2	9.5	--	—	1.3	—	3.5	—	—	2.5	—
Business and research services	2.3	2.0	.9	5.0	1.3	13.3	6.9	4.6	--	2.2	—
Manufacturing	1.9	.8	.9	11.2	5.1	4.5	6.9	22.7	(2)	1.8	(2)
Other industries	.6	.4	.9	3.8	—	--	--	—	—	1.5	—

[1] Excludes 2 not reporting industry.
[2] Too few cases to permit computation of percentages.

Industry	of education	Ph.D.	degree	degree	degree
	Number				
All industries	[1] 2,159	102	346	970	[2]
Government	1,740	27	236	816	
Colleges and universities	150	68	55	18	
Transportation by air	159	--	15	87	
Business and research services	52	2	23	21	
Manufacturing	43	3	12	22	
Other industries	15	2	5	6	
	Percent				
All industries	100.0	100.0	100.0	100.0	10
Government	80.6	26.5	68.2	84.1	8
Colleges and universities	6.9	66.6	15.9	1.8	
Transportation by air	7.4	--	4.3	9.0	
Business and research services	2.4	2.0	6.7	2.2	
Manufacturing	2.0	2.9	3.5	2.3	
Other industries	.7	2.0	1.4	.6	

[1] Excludes 2 not reporting industry and 175 not reporting level of education.
[2] Includes 159 with no college training.

TABLE C-10. --Age distribution and median age of meteorologists, by type of employer, 1951

Age group	All employers	Federal Government	State and local government	Colleges and universities	Private industry	Other employers
	Number					
All ages	[1] 2,318	1,886	5	149	254	
Under 25 years	79	67	--	3	6	
25 - 29 years	386	298	1	29	53	
30 - 34 years	775	603	3	60	101	
35 - 39 years	482	399	--	24	55	
40 - 44 years	313	279	1	10	21	
45 - 49 years	164	137	--	14	12	
50 - 54 years	66	58	--	5	3	
55 - 59 years	31	28	--	1	1	
60 - 64 years	12	9	--	2	1	
65 years and over	10	8	--	1	1	
	Percent					
All ages	[1] 100.0	100.0	([2])	100.0	100.0	10
Under 25 years	3.4	3.5	--	2.0	2.3	1
25 - 29 years	16.7	15.8	([2])	19.5	20.9	2
30 - 34 years	33.4	32.0	([2])	40.3	39.8	3
35 - 39 years	20.8	21.1	--	16.1	21.6	1
40 - 44 years	13.5	14.8	([2])	6.7	8.3	
45 - 49 years	7.1	7.3	--	9.4	4.7	
50 - 54 years	2.9	3.1	--	3.3	1.2	
55 - 59 years	1.3	1.5	--	.7	.4	
60 - 64 years	.5	.5	--	1.3	.4	
65 years and over	.4	.4	--	.7	.4	
Median age	34	35	([2])	34	33	

[1] Excludes 16 not reporting age and 2 not reporting type of employer.
[2] Too few cases to permit computation of percentages and median.

Table C-11.--Industries in which meteorologists were employed, by function performed, 1951

Industry	All functions	Production and operation	Administration	Research	Teaching	Consulting	Inspection	Technical writing	fu
	Number								
All industries	[1] 2,320	1,488	286	276	112	74	35	25	
Government	1,891	1,319	250	167	30	54	30	22	
Colleges and universities	150	2	5	65	78	-	-	-	
Transportation by air	167	138	22	2	-	4	1	-	
Business and research services	54	15	3	22	1	10	1	1	
Manufacturing	43	11	5	18	-	4	2	-	
Other industries	15	3	1	2	3	2	1	2	
	Percent								
All industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Government	81.5	88.7	87.4	60.5	26.8	73.0	85.6	88.0	
Colleges and universities	6.5	.1	1.7	23.6	69.6	-	-	-	
Transportation by air	7.2	9.3	7.7	.7	-	5.4	2.9	-	
Business and research services	2.3	1.0	1.0	8.0	.9	13.5	2.9	4.0	
Manufacturing	1.9	.7	1.8	6.5	-	5.4	5.7	-	
Other industries	.6	.2	.4	.7	2.7	2.7	2.9	8.0	

[1] Excludes 2 not reporting industry and 14 not reporting function.

Table C-12. --Functions performed by meteorologists, by level of education, 1951

Function	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No col degr
	Number				
All functions	[1] 2,150	102	344	966	
Production and operation	1,349	1	114	643	
Administration	270	10	50	128	
Research	270	52	98	102	
Teaching	110	36	51	15	
Consulting	69	1	15	36	
Inspection	34	-	4	19	
Technical writing	23	1	6	10	
Other functions	25	1	6	13	
	Percent				
All functions	100.0	100.0	100.0	100.0	
Production and operation	62.7	1.0	33.2	66.6	
Administration	12.6	9.8	14.5	13.2	
Research	12.6	51.0	28.5	10.6	
Teaching	5.1	35.2	14.8	1.6	
Consulting	3.2	1.0	4.4	3.7	
Inspection	1.6	-	1.2	2.0	
Technical writing	1.0	1.0	1.7	1.0	
Other functions	1.2	1.0	1.7	1.3	

[1] Excludes 11 not reporting function, 172 not reporting level of education, and 3 not reporting function and level o education.

[2] Includes 159 with no college training.

TABLE C-13. --Age distribution and median age of meteorologists, by function performed, 1951

Age group	All functions	Production and operation	Administration	Research	Teaching	Consulting	Inspection	Technical writing	Other functions
	Number								
All ages	[1] 2,307	1,484	280	274	112	73	35	24	25
Under 25 years	79	62	—	7	3	3	1	1	2
25 - 29 years	385	271	14	55	14	12	5	5	9
30 - 34 years	773	515	62	95	45	27	14	7	8
35 - 39 years	432	306	54	67	26	11	7	7	4
40 - 44 years	311	188	71	26	5	12	5	3	1
45 - 49 years	162	86	41	11	13	7	2	1	1
50 - 54 years	63	36	19	3	5	--	--	--	--
55 - 59 years	30	17	7	5	--	--	1	--	--
60 - 64 years	12	2	6	3	1	--	--	--	--
65 years and over	10	1	6	2	--	1	--	--	--
	Percent								
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 25 years	3.4	4.2	--	2.6	2.7	4.1	2.9	4.2	8.0
25 - 29 years	16.7	18.3	5.0	20.1	12.5	16.4	14.3	20.8	36.0
30 - 34 years	33.5	34.7	22.2	34.7	40.1	37.0	39.9	29.2	32.0
35 - 39 years	20.9	20.6	19.3	24.4	23.2	15.1	20.0	29.2	16.0
40 - 44 years	13.5	12.7	25.4	9.5	4.5	16.4	14.3	12.4	4.0
45 - 49 years	7.0	5.8	14.6	4.0	11.6	9.6	5.7	4.2	4.0
50 - 54 years	2.7	2.4	6.8	1.1	4.5	--	--	--	--
55 - 59 years	1.3	1.1	2.5	1.8	—	--	2.9	--	--
60 - 64 years	.5	.1	2.1	1.1	.9	--	--	--	--
65 years and over	.5	.1	2.1	.7	--	1.4	--	--	--
Median age	34	34	41	34	34	34	34	34	31

[1] Excludes 15 not reporting age, 13 not reporting function, and 1 not reporting age and function.

of education, 1951

Item	All levels of education	Ph. D.	Master's degree	Bachelor's degree	No col deg
	All types of employers				
Median income	$5,100	$6,800	$5,600	$5,300	
Lower quartile	4,300	5,800	4,800	4,500	
Upper quartile	6,200	8,300	6,600	6,200	
Median age	35	36	35	35	
	Private industry				
Median income	$5,800	(2)	$6,100	$5,700	
Lower quartile	$5,100	(2)	5,500	5,100	
Upper quartile	6,800	(2)	7,300	6,600	
Median age	33	(2)	33	33	
	Colleges and universities				
Median income	$5,500	$6,600	$4,600	(2)	
Lower quartile	4,400	5,600	4,000	(2)	
Upper quartile	7,000	8,000	5,600	(2)	
Median age	33	34	32	(2)	
	Government				
Median income	$5,000	$7,400	$5,700	$5,200	
Lower quartile	4,200	6,400	5,000	4,400	
Upper quartile	6,000	9,500	6,700	6,100	
Median age	35	39	36	35	

[1] Based upon reports from 1,882 meteorologists--excludes 454 not reporting one or more of the following: Income, type employer, or level of education.

[2] Too few cases to permit computation of medians and quartiles.

TABLE C-15. --Annual professional income of meteorologists, by age, 1951

Annual income	All ages	Under 25 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65 years and over
	Number										
Total	[1] 2,024	73	328	667	420	281	143	65	29	12	6
Under $3,000	32	7	15	4	3	1	--	1	--	1	--
$3,000 - $3,999	349	46	95	105	55	23	16	5	2	2	--
$4,000 - $4,999	606	9	112	214	125	73	39	22	9	3	--
$5,000 - $5,999	503	8	63	179	109	86	35	10	9	1	3
$6,000 - $6,999	293	2	25	96	78	53	25	11	2	--	1
$7,000 - $7,999	141	1	16	45	31	27	7	7	5	1	1
$8,000 - $9,999	69	--	1	22	14	12	13	4	1	1	1
$10,000 - $14,999	27	--	1	2	4	6	7	3	1	3	--
$15,000 and over	4	--	--	--	1	--	1	2	--	--	--
	Percent										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	[2]	[2]
Under $3,000	1.6	9.6	4.6	.6	.7	.3	--	1.5	--	[2]	--
$3,000 - $3,999	17.2	63.0	29.0	15.7	13.1	8.2	11.2	7.7	6.9	[2]	--
$4,000 - $4,999	29.9	12.3	34.1	32.1	29.8	26.0	27.2	33.8	31.0	[2]	--
$5,000 - $5,999	24.9	11.0	19.2	26.8	25.9	30.6	24.5	15.4	31.0	[2]	[2]
$6,000 - $6,999	14.5	2.7	7.6	14.4	18.6	18.9	17.5	16.9	6.9	--	[2]
$7,000 - $7,999	7.0	1.4	4.9	6.8	7.4	9.6	4.9	10.8	17.2	[2]	[2]
$8,000 - $9,999	3.4	--	.3	3.3	3.3	4.3	9.1	6.2	3.5	[2]	[2]
$10,000 - $14,999	1.3	--	.3	.3	1.0	2.1	4.9	4.6	3.5	[2]	--
$15,000 and over	.2	--	--	--	.2	--	.7	3.1	--	--	--
Median income	$5,000	$3,600	$4,500	$5,100	$5,200	$5,500	$5,500	$5,500	$5,400	[2]	[2]
Lower quartile	4,200	3,200	3,700	4,300	4,400	4,600	4,500	4,500	4,600	[2]	[2]
Upper quartile	6,100	4,200	5,400	6,000	6,300	6,500	6,700	7,000	6,900	[2]	[2]

[1] Excludes 296 not reporting income, 13 not reporting age, and 3 not reporting income and age.
[2] Too few to permit computation of percentages, medians, and quartiles.

TABLE C-16.--Annual professional income of meteorologists, by level of education, 1951

Annual income	All levels of education	Ph.D.	Master's degree	Bachelor's degree	No c... de...
	Number				
Total	[1] 1,888	88	290	850	
Under $3,000	30	1	4	11	
$3,000 - $3,999	292	--	17	89	
$4,000 - $4,999	555	5	62	249	
$5,000 - $5,999	490	19	97	261	
$6,000 - $6,999	286	23	58	149	
$7,000 - $7,999	139	16	28	61	
$8,000 - $9,999	67	12	16	25	
$10,000 - $14,999	25	10	7	4	
$15,000 and over	4	2	1	1	
	Percent				
Total	100.0	100.0	100.0	100.0	
Under $3,000	1.6	1.1	1.4	1.3	
$3,000 - $3,999	15.5	--	5.9	10.5	
$4,000 - $4,999	29.4	5.7	21.3	29.3	
$5,000 - $5,999	26.0	21.6	33.5	30.7	
$6,000 - $6,999	15.1	26.1	20.0	17.5	
$7,000 - $7,999	7.4	18.2	9.7	7.2	
$8,000 - $9,999	3.5	13.6	5.5	2.9	
$10,000 - $14,999	1.3	11.4	2.4	.5	
$15,000 and over	.2	2.3	.3	.1	
Median income	$5,100	$6,800	$5,600	$5,300	
Lower quartile	4,300	5,800	4,800	4,500	
Upper quartile	6,200	8,300	6,600	6,200	

[1] Excludes 273 not reporting income, 149 not reporting level of education, and 26 not reporting income and level of education.

[2] Includes 145 with no college training.

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